STORMWATER REPORT
386-394 WATERTOWN STREET
NEWTON, MASSACHUSETTS

June 12, 2017

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INTRODUCTION

VTP Associates has performed a stormwater management analysis to evaluate the post-development impacts created by the proposed residential at #386-#394 Watertown Street in Newton, Massachusetts. . The project will include a new residence building with approximately 9 units and 1,573 square feet of commercial space, on ground parking (under building), landscaped areas, and an associated stormwater management system.

VTP Associates analyzed the hydrology for the drainage areas impacted by the proposed work utilizing the Soil Conservation Service's (SCS) Runoff Curve Number (CN) methodology. VTP Associates used the HydroCAD computer modeling system in conjunction with the SCS's methods to determine the peak rate of runoff for the 2, 10, and 100-year storm events.

VTP Associates proposes the use of best management practices (BMPs) as defined by the Massachusetts Department of Environmental Protection (MA DEP) for stormwater management onsite to protect downstream receiving waters from adverse water quality impacts due to stormwater runoff. Mitigating the rate and quality of stormwater runoff from the project site will also help to lessen the environmental impact of the proposed development.

METHODOLOGY

Hydrology and Hydraulics

VTP Associates analyzed the survey base plan and conducted a site visit to determine the existing drainage flow patterns onsite. The existing conditions survey, in conjunction with aerial photography, and site visits were used to determine existing surface coverage areas for the site. VTP Associates determined that a majority of the pre-developed surface cover for the study area is impervious cover. Initial soil research was determined using the Natural Resources Conservation Service (NRCS) soil survey maps for Middlesex County, Massachusetts via Web Soil Survey 1.1. According to the soil survey, the soil on the site consists of the following:

626B: Merrimac – Urban land complex

Test pit was conducted and determined that the site consists of a moderately high to high draining coarse sand. Based upon these findings, VTP Associates used a Hydrologic soil group 'A' for its drainage calculations. The test pit information has been included within this report. As per the Mass DEP Stormwater Hydrology Handbook for Conservation Commissions, VTP used a design infiltration rate of 7.0 in/hr for 'A' soils.

For each subcatchment area, VTP Associates determined drainage flow path lengths, surface cover type and slopes for sheet and shallow concentrated flow. The information was used to calculate the time of concentration (Tc) for each subcatchment areas. Where applicable, a minimum Tc of 5 minutes was used; the minimum value for highly developed, small catchment areas. SCS Runoff Curve Numbers were selected by using the cover type and hydrologic soil group of each area. The peak runoff rates for the 2, 10 and 100-year storm events were then determined by inputting the weighted CN, Tc, drainage areas, and drainage system information into the HydroCAD storm water modeling system computer program. The storm events were based on the 24-hour duration storm with a SCS Type III storm distribution curve.

Storm Event

VTP Associates used Massachusetts rainfall data maps from Technical Paper 40, Rainfall Frequency Atlas of the United States and the City of Newton's Requirements for On-Site Drainage to estimate the rainfall depth for the 2, 10 and 100-year storms. The rainfall depths for the 24-hour storm events used are as follows:

Storm Event	24-Hour Rainfall Depth (inches)
2-year	3.1
10-year	4.5
100-year	8.78

HYDROLOGICAL ANALYSIS

Pre-Development Conditions

The existing site consists of a one-story brick building, a detached garage/storage, a driveway and parking lot. Approximately 4,896 square feet (69%) of the site is impervious cover. The site is bound by residential building to the southwest, northeast and southeast, and Watertown Street to the northwest.

VTP Associates compiled the existing drainage areas from an existing conditions survey prepared by VTP Associates. Additionally, VTP Associates conducted site visits to evaluate the existing onsite drainage patterns and watershed divides from the existing conditions survey. At present, stormwater runoffs from the existing study area drain to an existing catch basing on site (E1). The pre-development drainage areas are shown on "Figure 1: Pre-Development Drainage Areas."

Post Development Conditions

The proposed project includes the construction of a new multi-family residence, consisting 9units and 1,573 square feet of commercial, on ground parking (under building), landscaped areas, and associated drainage improvements. As a result, approximately 97% of the site is impervious. The same overall area was analyzed for the proposed conditions as the pre-development conditions and is shown on "Figure 2: Post-Development Drainage Areas." Similar to pre-development conditions, the stormwater runoff flows in the same direction. The same design points were used as in the pre-development conditions.

The new residence will have approximately 8,210 square feet of impervious, or roof, and the opencast driveway will be approximately 724 square feet. The roof runoff areas are separated into three drainage areas and discharge to a respective underground infiltration system. The roof runoff areas (PR1) and (PR2) will be collected by roof leaders and discharge into the onsite infiltration system #1 (INF-1). The roof runoff area (PR3) will be collected by roof leaders and discharge into the onsite infiltration system #2 (INF-2). The plaza runoff (PL1) will be discharge into the onsite infiltration system #1 (INF-1). The plaza runoff (PL2) will be discharge into the onsite infiltration system #2 (INF-2). The driveway runoff (PD) will be collected by a catch basin and discharge into onsite infiltration system #1 (INF-1). Infiltration system #1 and #2 are connected each other by two 6" pipes. The intent of the proposed stormwater management systems are to infiltrate stormwater runoff of the proposed building and driveway. The infiltration system was designed to control the 100-year storm with the addition of overflow to the infiltration systems and help mitigate proposed peak rates of runoff to less than existing conditions. The drainage areas can be seen on "Figure 2: Post-Development Drainage Areas."

VTP Associates analyzed the pre- and post-development site conditions to determine the peak rates of runoff at the design points. By incorporating the stormwater management features discussed above, the peak rates of runoff in the post-development condition is to be better than pre-development levels. Pre-development peak runoff rates vs. post-development peak runoff rates for the 2, 10, and 100-year storm events are presented in Table 1 below.

Table 1, Pre-development vs. Post-Development Peak Rate of Runoff

Design Point #1 – On Site (Ex. CB-Pr. Floor Drains)

STORM EVENT (DESIGN POINT)	*PRE-DEVELOPMENT PEAK RATE OF RUNOFF (CFS)*	*POST-DEVELOPMENT PEAK RATE OF RUNOFF (CFS)*	*PRE-DEVELOPMENT VOLUME OF RUNOFF (AF)*	*POST-DEVELOPMENT VOLUME OF RUNOFF (AF)*
2-YEAR	0.53	0.01	0.036	0.001
10-YEAR	0.86	0.03	0.060	0.002
100-YEAR	1.86	0.09	0.136	0.006

CONCLUSION

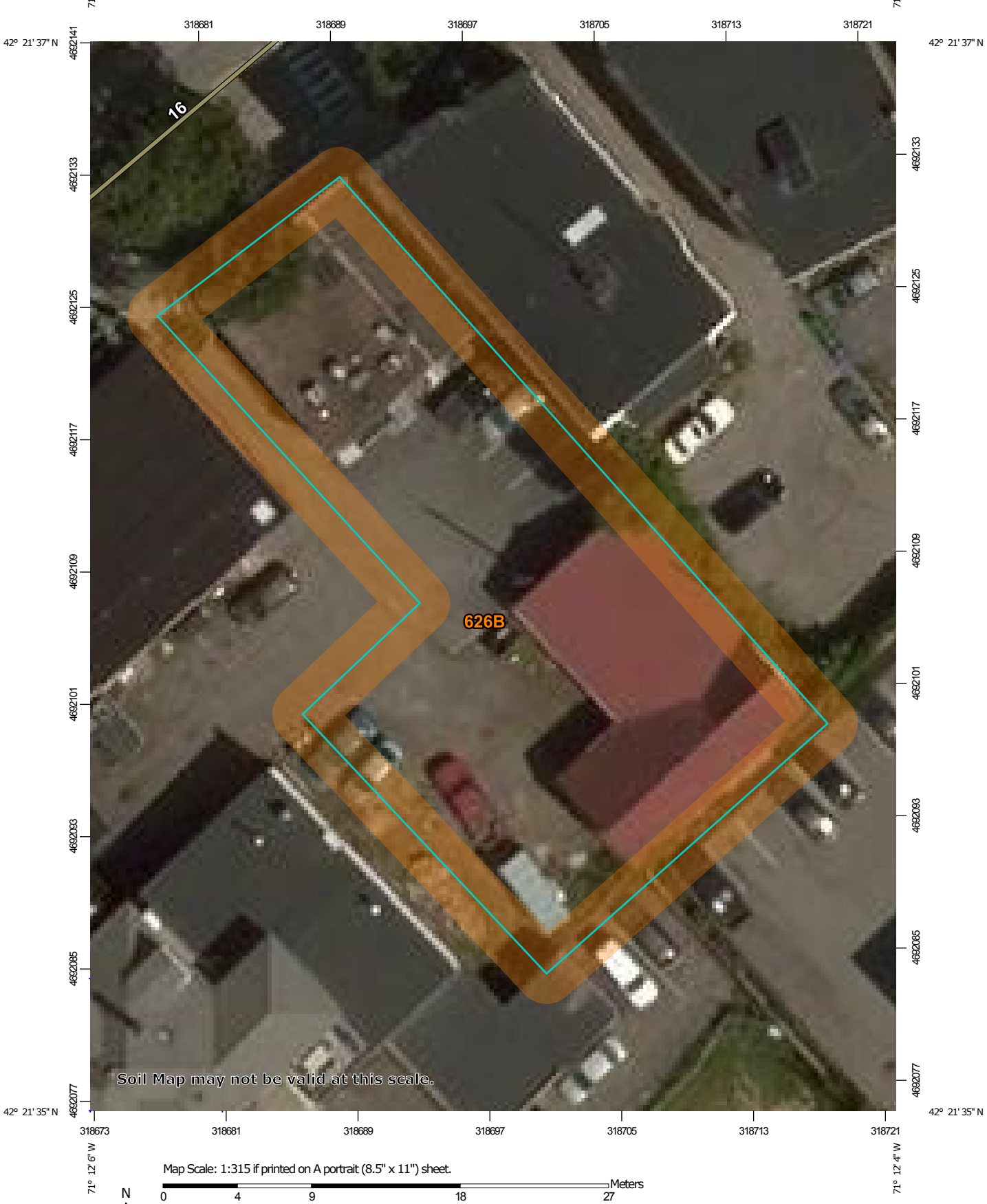
The post-development peak rate of runoff is expected to be less than or equal to pre-development levels for the 2, 10, and 100-year storm events. Although there is increased impervious coverage on the site as a result of the proposed redevelopment, the addition of the underground infiltration systems controls the post-development runoff to pre-development levels or better.

ENCLOSURES

Test Pit
NRCS Soil Map
Pre-Development Drainage Areas (Figure 1)
Post-Development Drainage Areas (Figure 2)
Pre & Post Development HydroCAD Calculations

TESTPIT LOG
TESTPIT #1 0–62" TOPSOIL+FILL 62–73" SUBSOIL 73–108" COARSE SAND W/GRAVEL+COBBLES
WATER WEEPING @ 90" NO REFUSAL PERC < 2 MPI

Custom Soil Resource Report
Soil Map



Map Scale: 1:315 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 4 9 18 27

Feet: 0 15 30 60 90

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 16, Sep 14, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 10, 2014—Aug 25, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Middlesex County, Massachusetts (MA017)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	0.2	100.0%
Totals for Area of Interest		**0.2**	**100.0%**

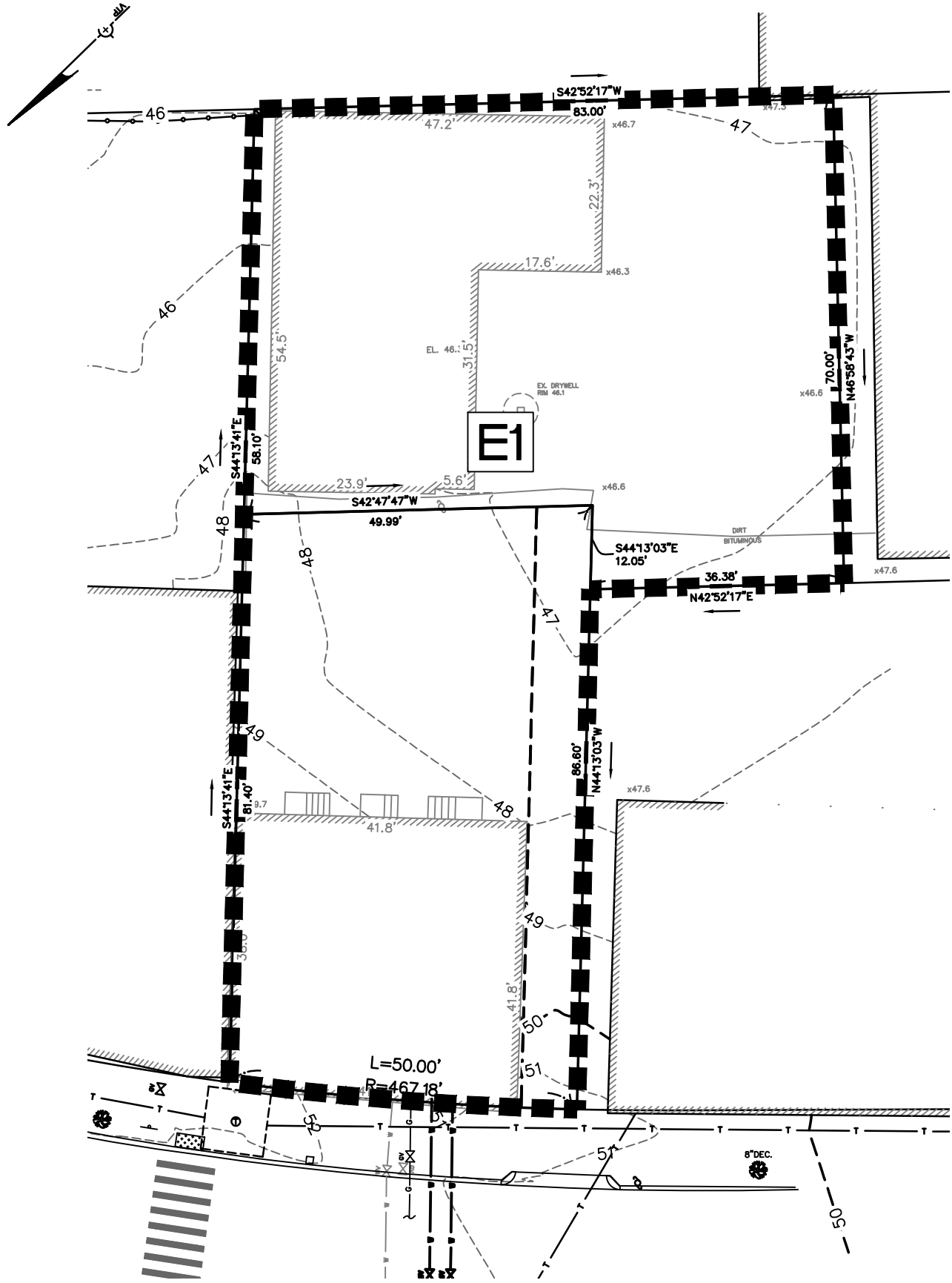
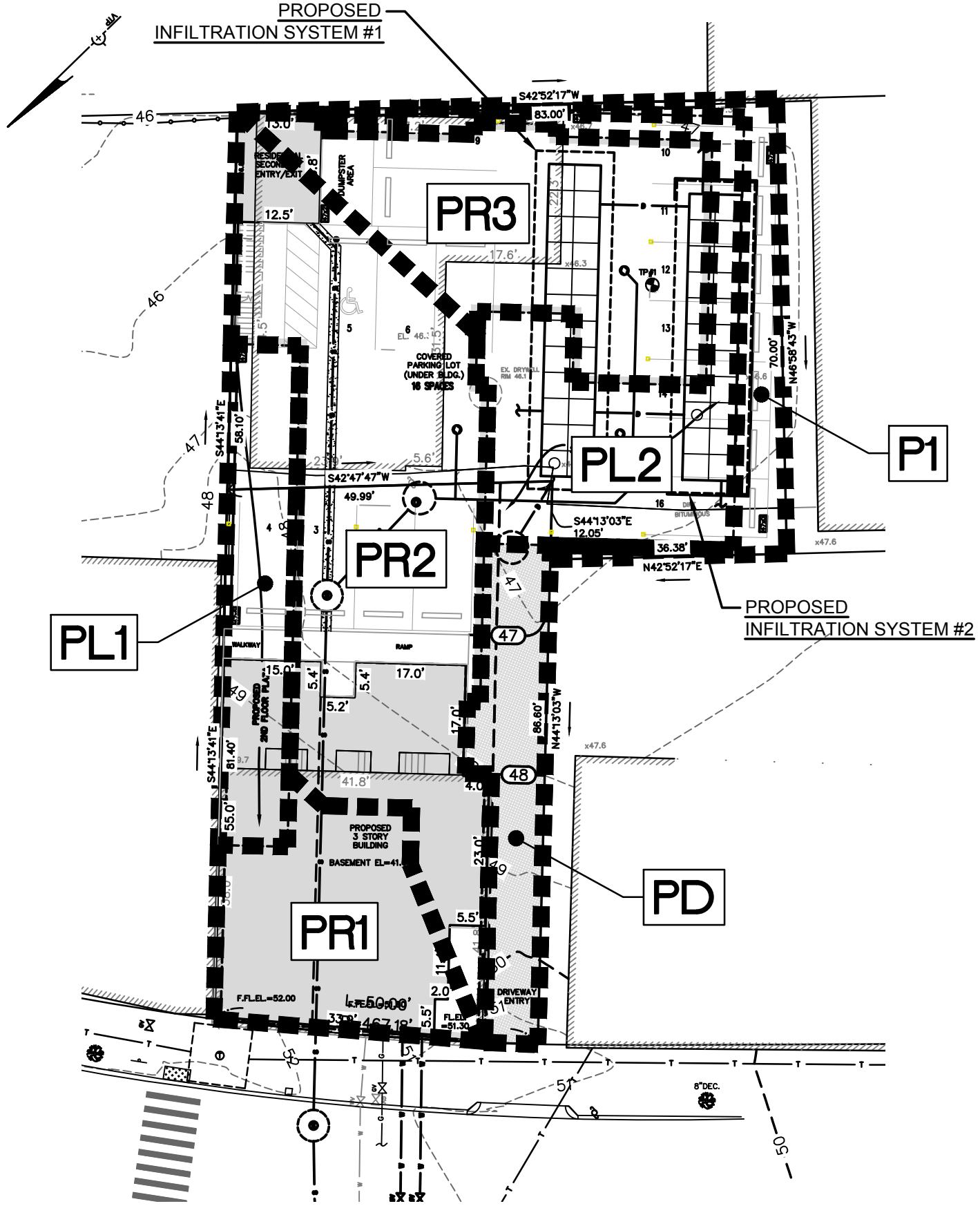


FIGURE 1:
PRE-DEVELOPMENT DRAINAGE AREAS
386-394 WATERTOWN STREET NEWTON, MA

SCALE: 1in.=20ft.
DATE: JUNE 12, 2017



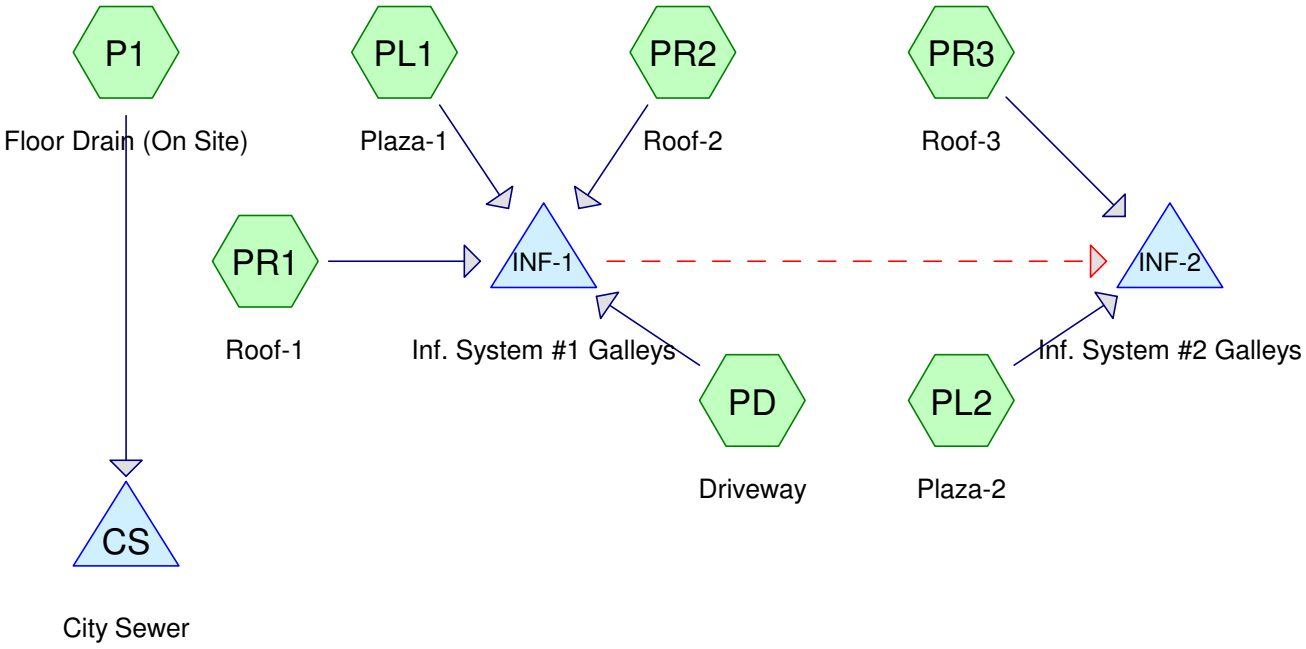
SCALE: 1in.=20ft.
DATE: JUNE 12, 2017

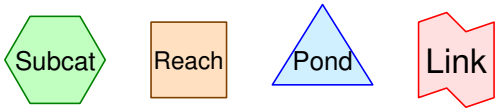
FIGURE 2:
POST-DEVELOPMENT DRAINAGE AREAS
386-394 WATERTOWN STREET NEWTON, MA

PRE-DEVELOPMENT CONDITIONS

Catch Basin on Site

POST-DEVELOPMENT CONDITIONS





Routing Diagram for 216101_386-394 Watertown St Newton, MA
Prepared by VTP associates, inc., Printed 6/13/2017

Summary for Subcatchment E1: Catch Basin on Site

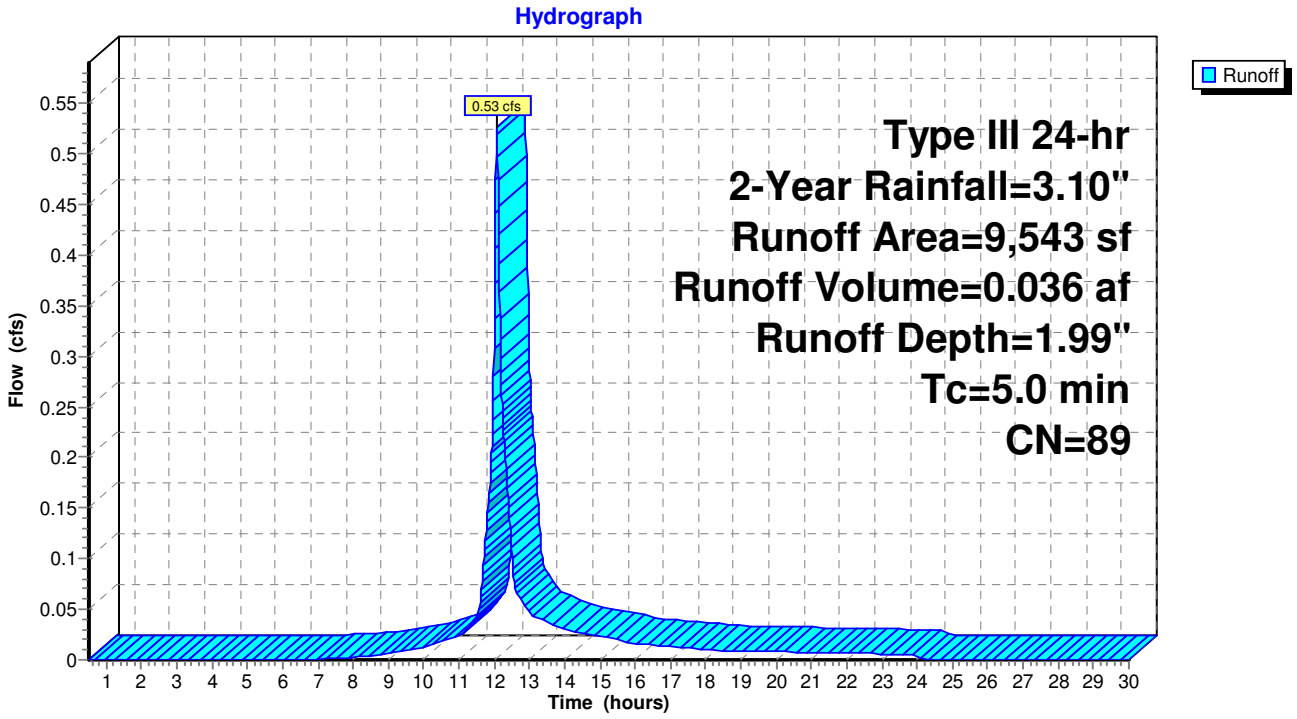
Runoff = 0.53 cfs @ 12.07 hrs, Volume= 0.036 af, Depth= 1.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	3,661	98	Ex. House Roof
*	2,860	98	Paved Driveway
*	62	98	Landing/Steps
*	2,686	72	Dirt
	274	39	>75% Grass cover, Good, HSG A
	9,543	89	Weighted Average
	2,960		31.02% Pervious Area
	6,583		68.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment E1: Catch Basin on Site



Summary for Subcatchment P1: Floor Drain (On Site)

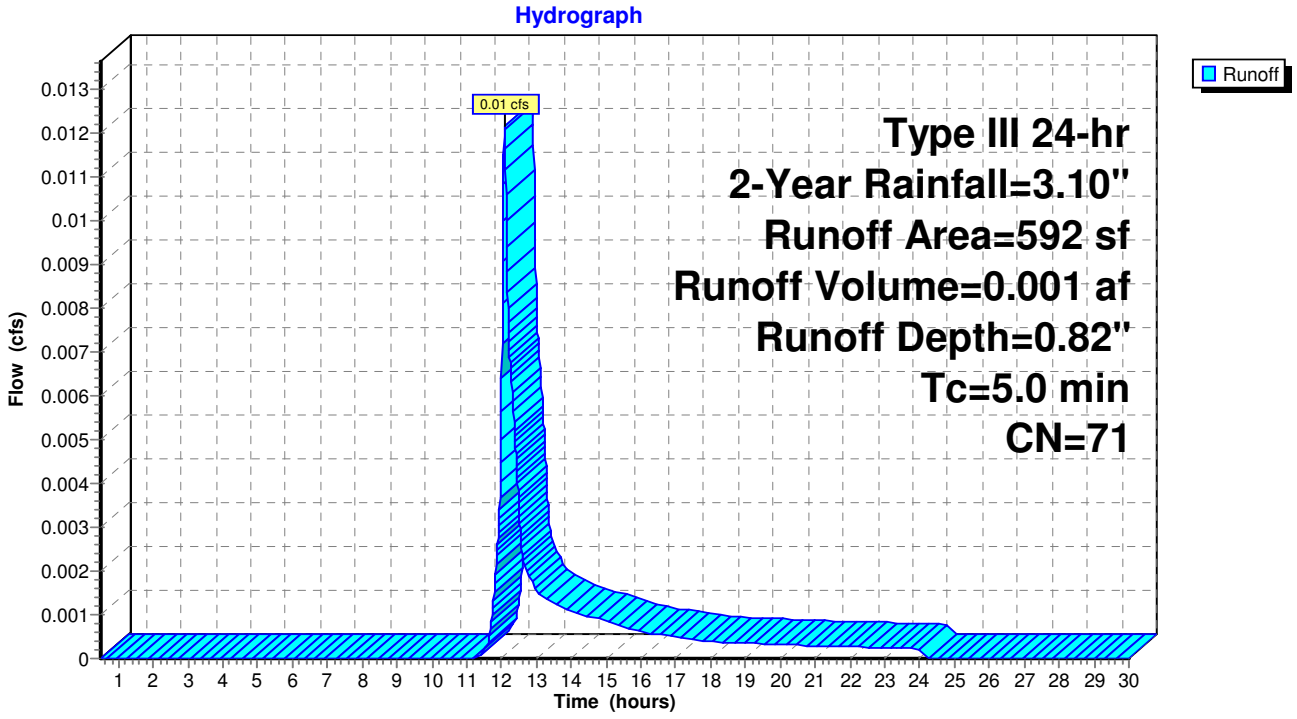
Runoff = 0.01 cfs @ 12.09 hrs, Volume= 0.001 af, Depth= 0.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	325	98	Parking Lot (portion)
	267	39	>75% Grass cover, Good, HSG A
	592	71	Weighted Average
	267		45.10% Pervious Area
	325		54.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment P1: Floor Drain (On Site)



Summary for Subcatchment PD: Driveway

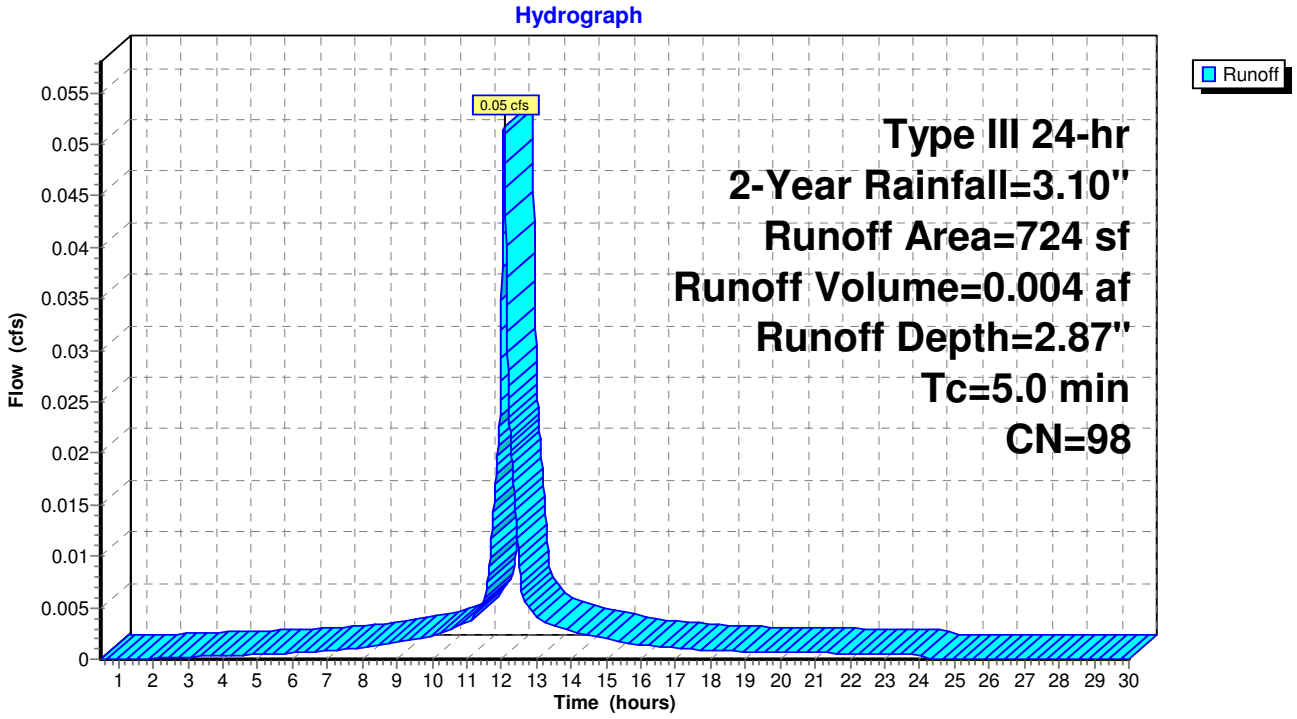
Runoff = 0.05 cfs @ 12.07 hrs, Volume= 0.004 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	724	98	Paved Driveway
	724		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment PD: Driveway



Summary for Subcatchment PL1: Plaza-1

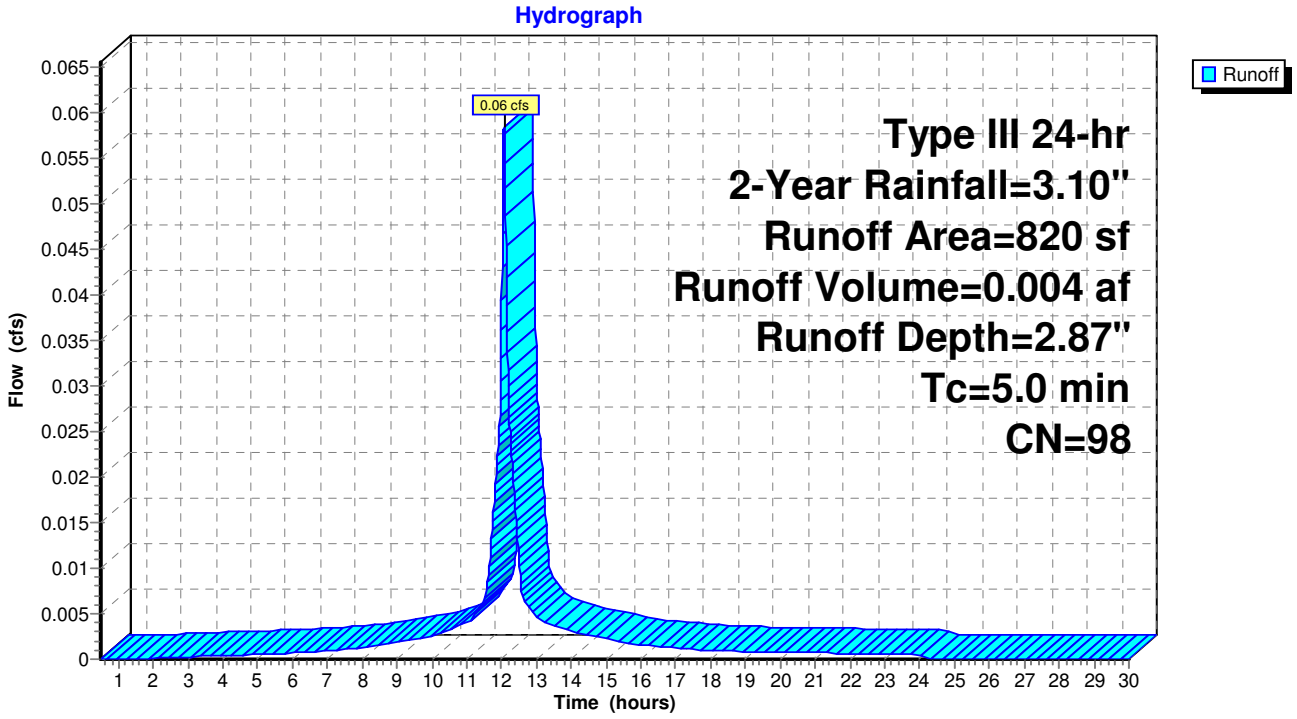
Runoff = 0.06 cfs @ 12.07 hrs, Volume= 0.004 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	820	98	Paza-1
	820		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment PL1: Plaza-1



Summary for Subcatchment PL2: Plaza-2

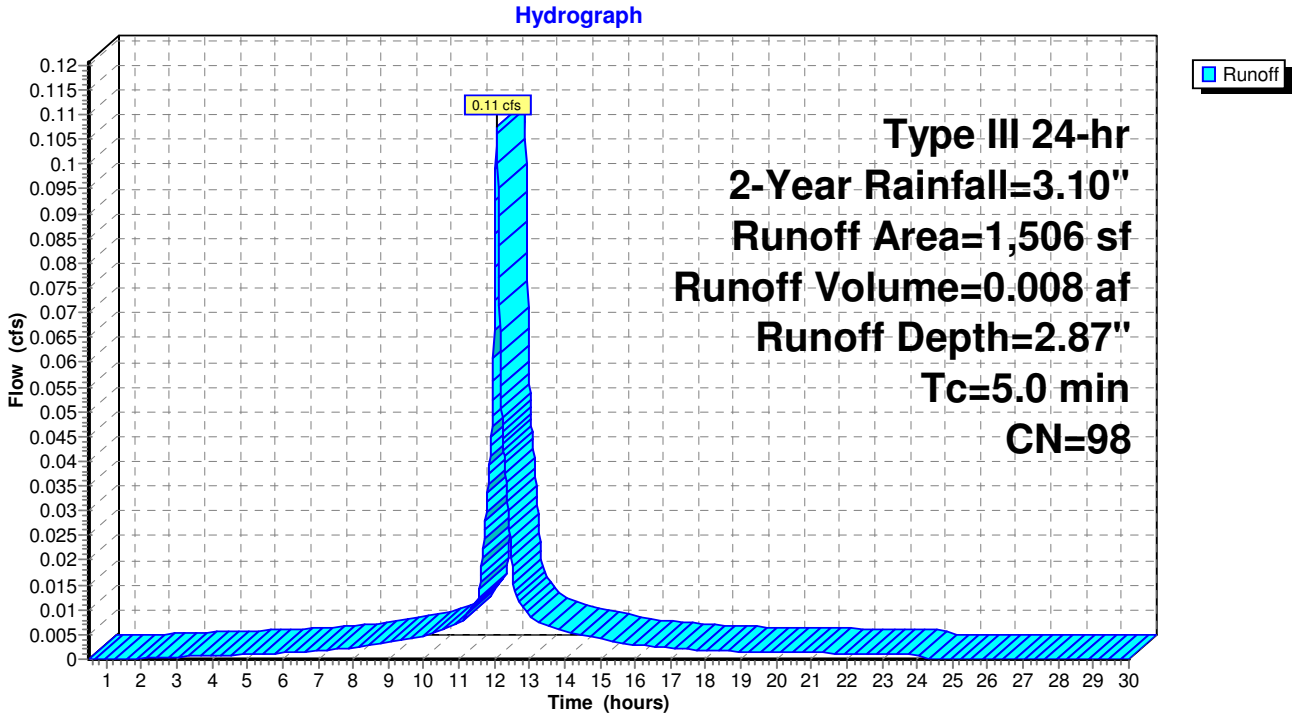
Runoff = 0.11 cfs @ 12.07 hrs, Volume= 0.008 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	1,506	98	Paza-2
	1,506		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment PL2: Plaza-2



Summary for Subcatchment PR1: Roof-1

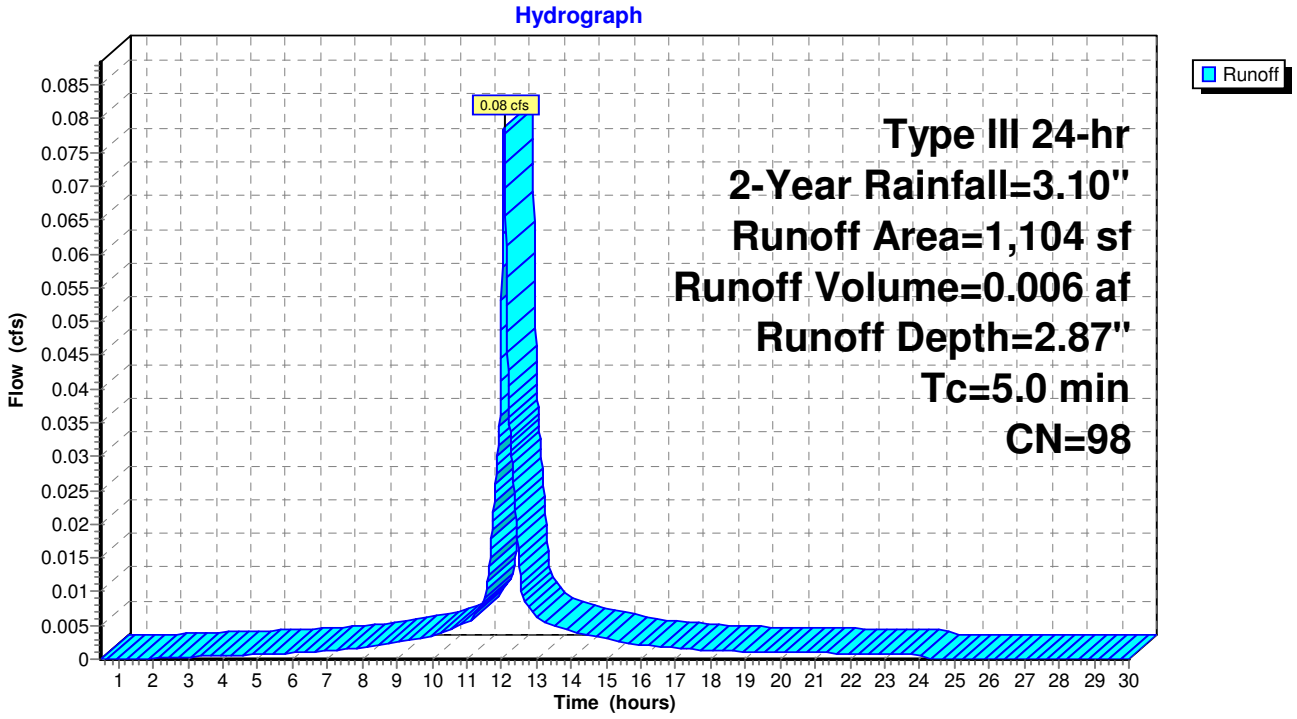
Runoff = 0.08 cfs @ 12.07 hrs, Volume= 0.006 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	1,104	98	Prop. Roof-1
	1,104		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment PR1: Roof-1



Summary for Subcatchment PR2: Roof-2

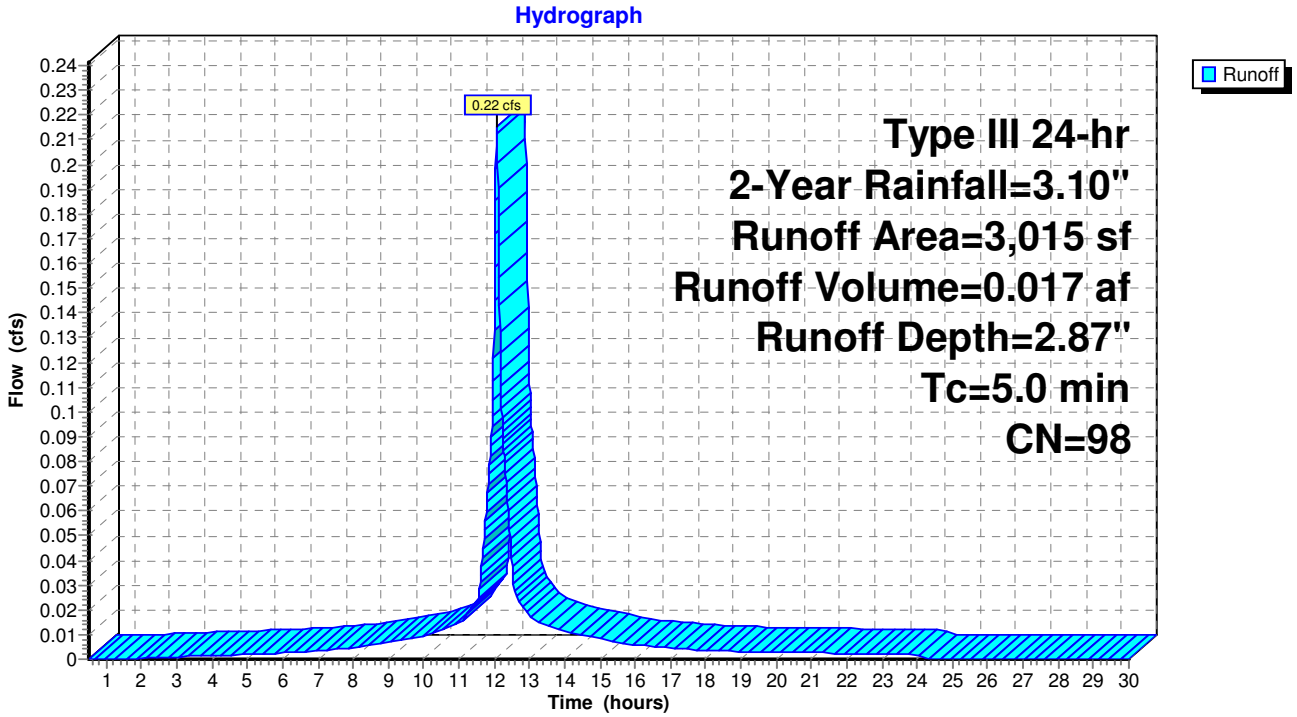
Runoff = 0.22 cfs @ 12.07 hrs, Volume= 0.017 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	3,015	98	Prop. Roof-2
	3,015		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment PR2: Roof-2



Summary for Subcatchment PR3: Roof-3

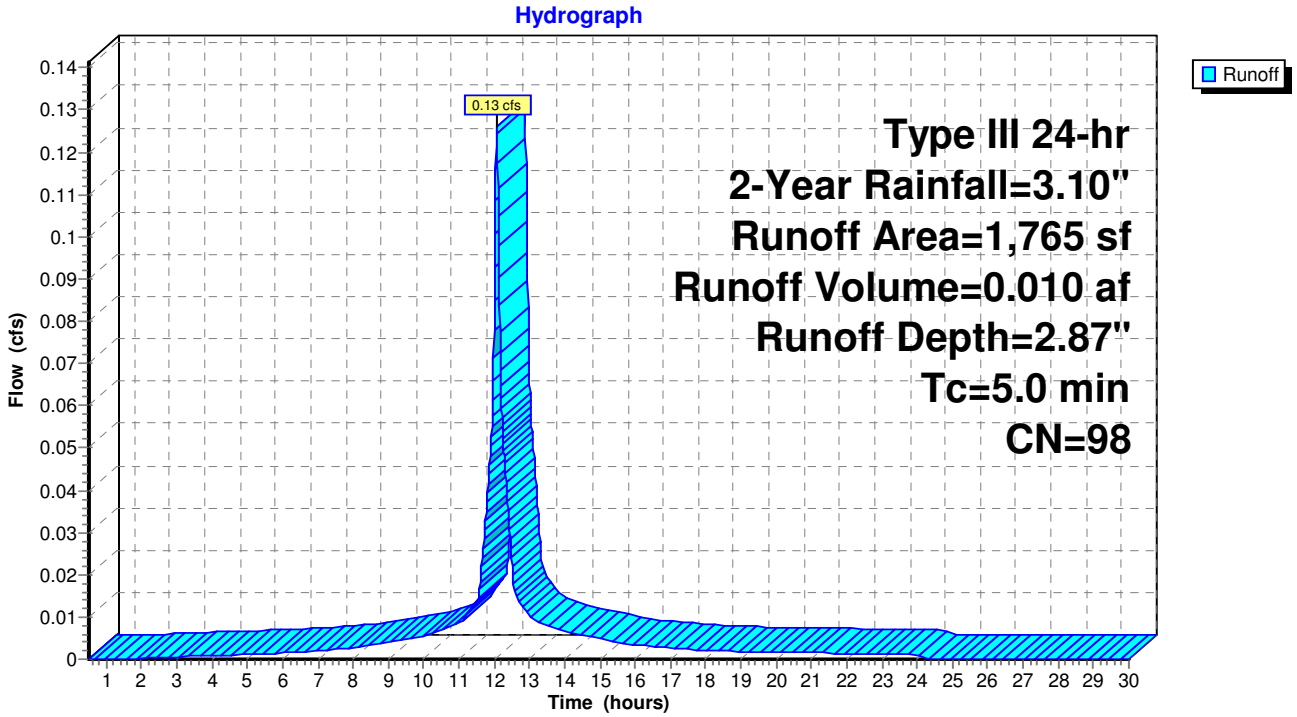
Runoff = 0.13 cfs @ 12.07 hrs, Volume= 0.010 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.10"

	Area (sf)	CN	Description
*	1,765	98	Prop. Roof-3
	1,765		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment PR3: Roof-3

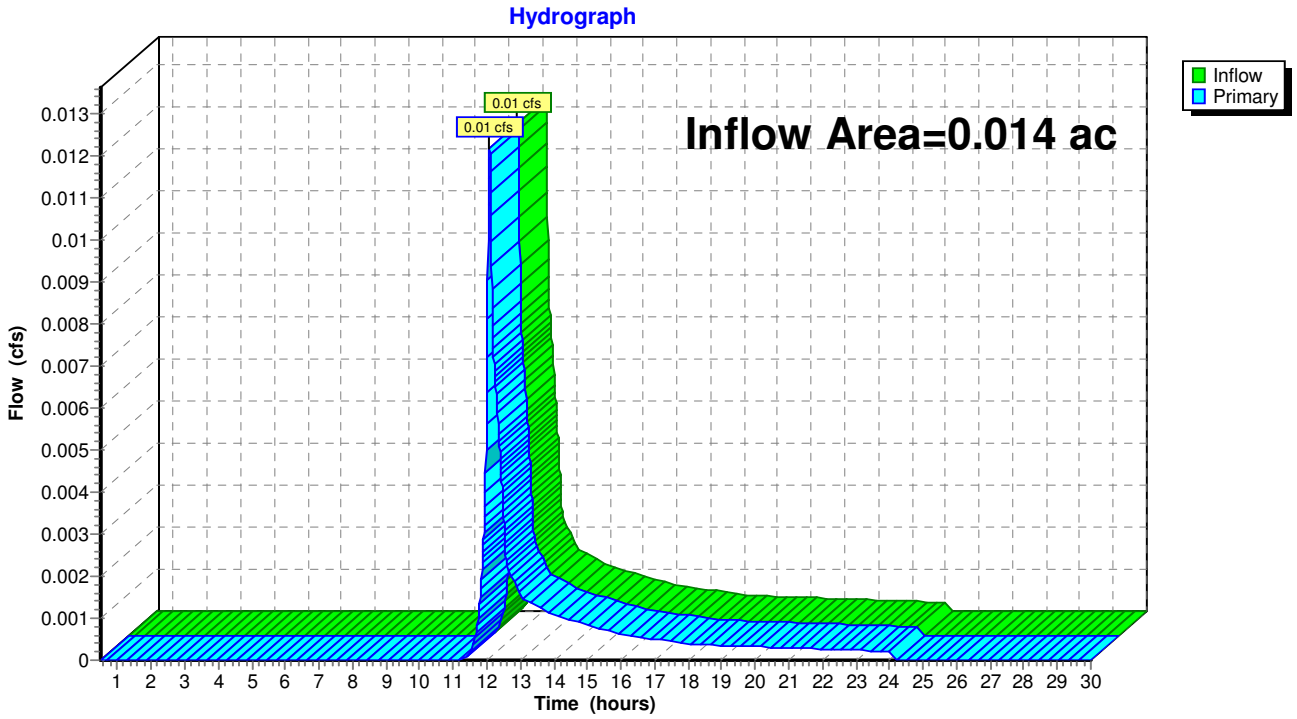


Summary for Pond CS: City Sewer

Inflow Area = 0.014 ac, 54.90% Impervious, Inflow Depth = 0.82" for 2-Year event
Inflow = 0.01 cfs @ 12.09 hrs, Volume= 0.001 af
Primary = 0.01 cfs @ 12.09 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs

Pond CS: City Sewer



Summary for Pond INF-1: Inf. System #1 Galleys

Inflow Area = 0.130 ac,100.00% Impervious, Inflow Depth = 2.87" for 2-Year event
Inflow = 0.40 cfs @ 12.07 hrs, Volume= 0.031 af
Outflow = 0.10 cfs @ 11.76 hrs, Volume= 0.031 af, Atten= 75%, Lag= 0.0 min
Discarded = 0.10 cfs @ 11.76 hrs, Volume= 0.031 af
Secondary = 0.00 cfs @ 0.50 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Peak Elev= 41.79' @ 12.43 hrs Surf.Area= 0.014 ac Storage= 0.006 af

Plug-Flow detention time= 12.0 min calculated for 0.031 af (100% of inflow)
Center-of-Mass det. time= 12.0 min (768.1 - 756.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	40.70'	0.012 af	**12.00'W x 52.00'L x 4.00'H Field A** 0.057 af Overall - 0.024 af Embedded = 0.033 af x 35.0% Voids
#2A	41.70'	0.017 af	**Concrete Galley 4x4x3** x 24 Inside #1 Inside= 42.0"W x 30.0"H => 8.91 sf x 3.50'L = 31.2 cf Outside= 48.0"W x 36.0"H => 10.81 sf x 4.00'L = 43.2 cf 2 Rows of 12 Chambers
		0.029 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	40.70'	**7.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Secondary	43.70'	**6.0" Round 6" Connection X 2.00** L= 13.7' Ke= 0.200 Inlet / Outlet Invert= 43.70' / 43.70' S= 0.0000 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.10 cfs @ 11.76 hrs HW=40.74' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.50 hrs HW=40.70' (Free Discharge)
↑**2=6" Connection** (Controls 0.00 cfs)

Pond INF-1: Inf. System #1 Galleys - Chamber Wizard Field A

Chamber Model = Concrete Galley 4x4x3 (Concrete Galley, Shea LE-EGLPH, LE-CGLPH or equivalent)
Inside= 42.0"W x 30.0"H => 8.91 sf x 3.50'L = 31.2 cf
Outside= 48.0"W x 36.0"H => 10.81 sf x 4.00'L = 43.2 cf

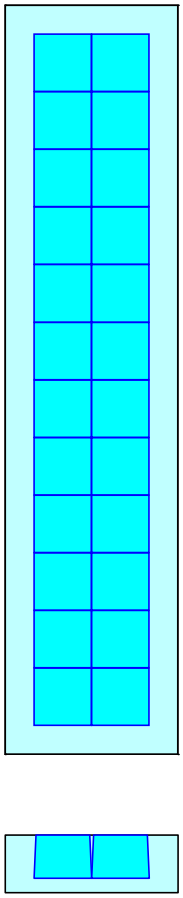
12 Chambers/Row x 4.00' Long = 48.00' Row Length +24.0" End Stone x 2 = 52.00' Base Length
2 Rows x 48.0" Wide + 24.0" Side Stone x 2 = 12.00' Base Width
12.0" Base + 36.0" Chamber Height = 4.00' Field Height

24 Chambers x 31.2 cf = 748.6 cf Chamber Storage
24 Chambers x 43.2 cf = 1,037.7 cf Displacement

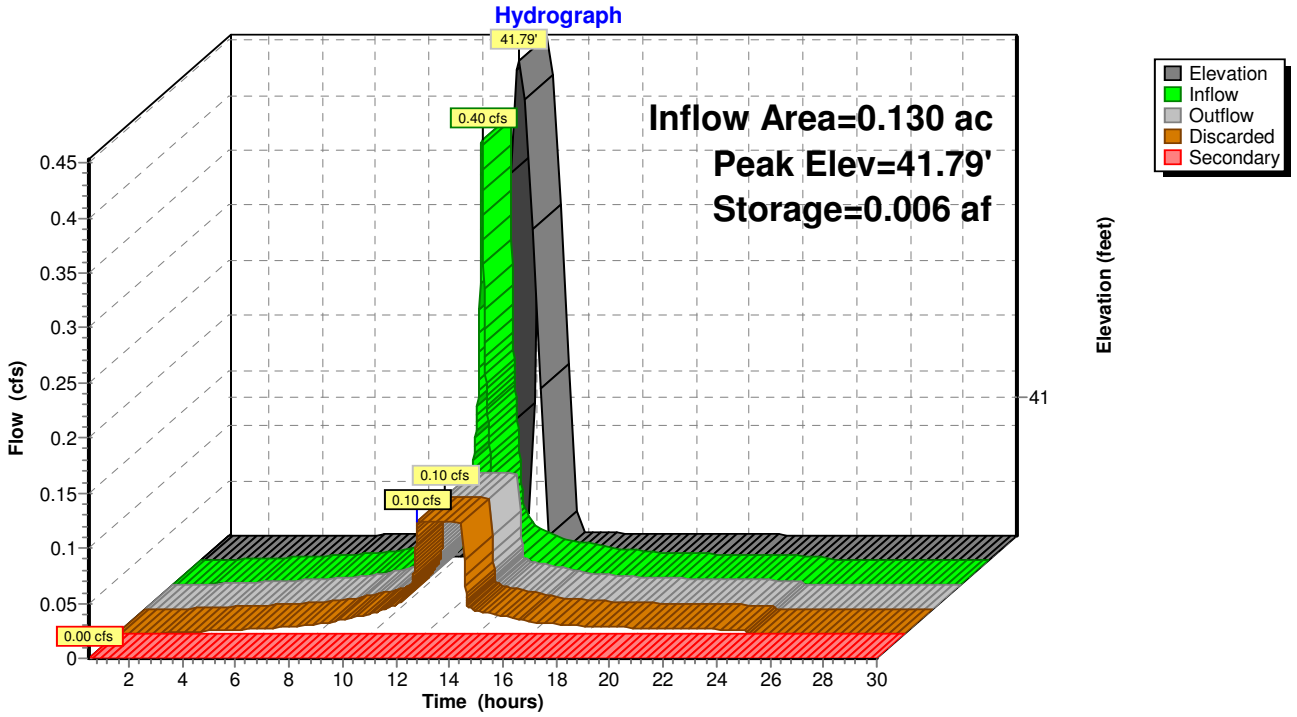
2,496.0 cf Field - 1,037.7 cf Chambers = 1,458.3 cf Stone x 35.0% Voids = 510.4 cf Stone Storage

Chamber Storage + Stone Storage = 1,259.0 cf = 0.029 af
Overall Storage Efficiency = 50.4%
Overall System Size = 52.00' x 12.00' x 4.00'

24 Chambers
92.4 cy Field
54.0 cy Stone



Pond INF-1: Inf. System #1 Galleys



Summary for Pond INF-2: Inf. System #2 Galleys

Inflow Area = 0.075 ac,100.00% Impervious, Inflow Depth = 2.87" for 2-Year event
Inflow = 0.23 cfs @ 12.07 hrs, Volume= 0.018 af
Outflow = 0.09 cfs @ 11.93 hrs, Volume= 0.018 af, Atten= 60%, Lag= 0.0 min
Discarded = 0.09 cfs @ 11.93 hrs, Volume= 0.018 af

Routing by Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Peak Elev= 41.10' @ 12.26 hrs Surf.Area= 0.013 ac Storage= 0.002 af

Plug-Flow detention time= 4.3 min calculated for 0.018 af (100% of inflow)
Center-of-Mass det. time= 4.3 min (760.4 - 756.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	40.69'	0.011 af	**12.00'W x 48.00'L x 4.00'H Field A** 0.053 af Overall - 0.022 af Embedded = 0.031 af x 35.0% Voids
#2A	41.69'	0.016 af	**Concrete Galley 4x4x3** x 22 Inside #1 Inside= 42.0"W x 30.0"H => 8.91 sf x 3.50'L = 31.2 cf Outside= 48.0"W x 36.0"H => 10.81 sf x 4.00'L = 43.2 cf 2 Rows of 11 Chambers
		0.027 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	40.69'	**7.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.09 cfs @ 11.93 hrs HW=40.73' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Pond INF-2: Inf. System #2 Galleys - Chamber Wizard Field A

Chamber Model = Concrete Galley 4x4x3 (Concrete Galley, Shea LE-EGLPH, LE-CGLPH or equivalent)
Inside= 42.0"W x 30.0"H => 8.91 sf x 3.50'L = 31.2 cf
Outside= 48.0"W x 36.0"H => 10.81 sf x 4.00'L = 43.2 cf

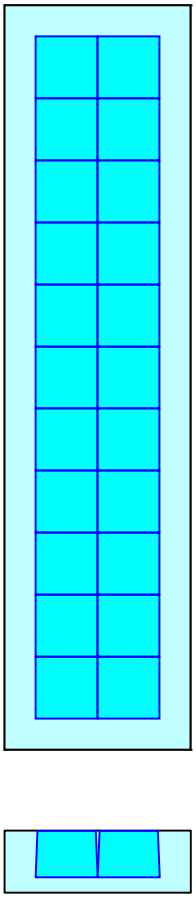
11 Chambers/Row x 4.00' Long = 44.00' Row Length +24.0" End Stone x 2 = 48.00' Base Length
2 Rows x 48.0" Wide + 24.0" Side Stone x 2 = 12.00' Base Width
12.0" Base + 36.0" Chamber Height = 4.00' Field Height

22 Chambers x 31.2 cf = 686.2 cf Chamber Storage
22 Chambers x 43.2 cf = 951.2 cf Displacement

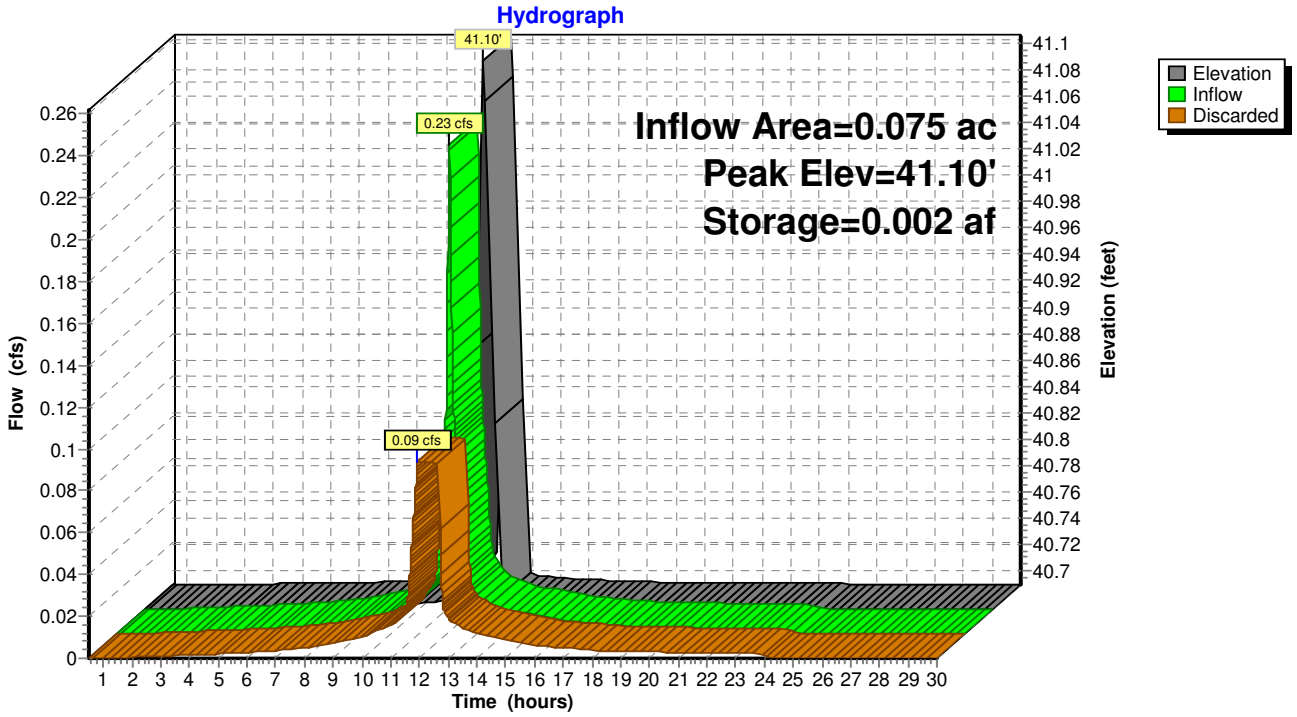
2,304.0 cf Field - 951.2 cf Chambers = 1,352.8 cf Stone x 35.0% Voids = 473.5 cf Stone Storage

Chamber Storage + Stone Storage = 1,159.7 cf = 0.027 af
Overall Storage Efficiency = 50.3%
Overall System Size = 48.00' x 12.00' x 4.00'

22 Chambers
85.3 cy Field
50.1 cy Stone



Pond INF-2: Inf. System #2 Galleys



Summary for Subcatchment E1: Catch Basin on Site

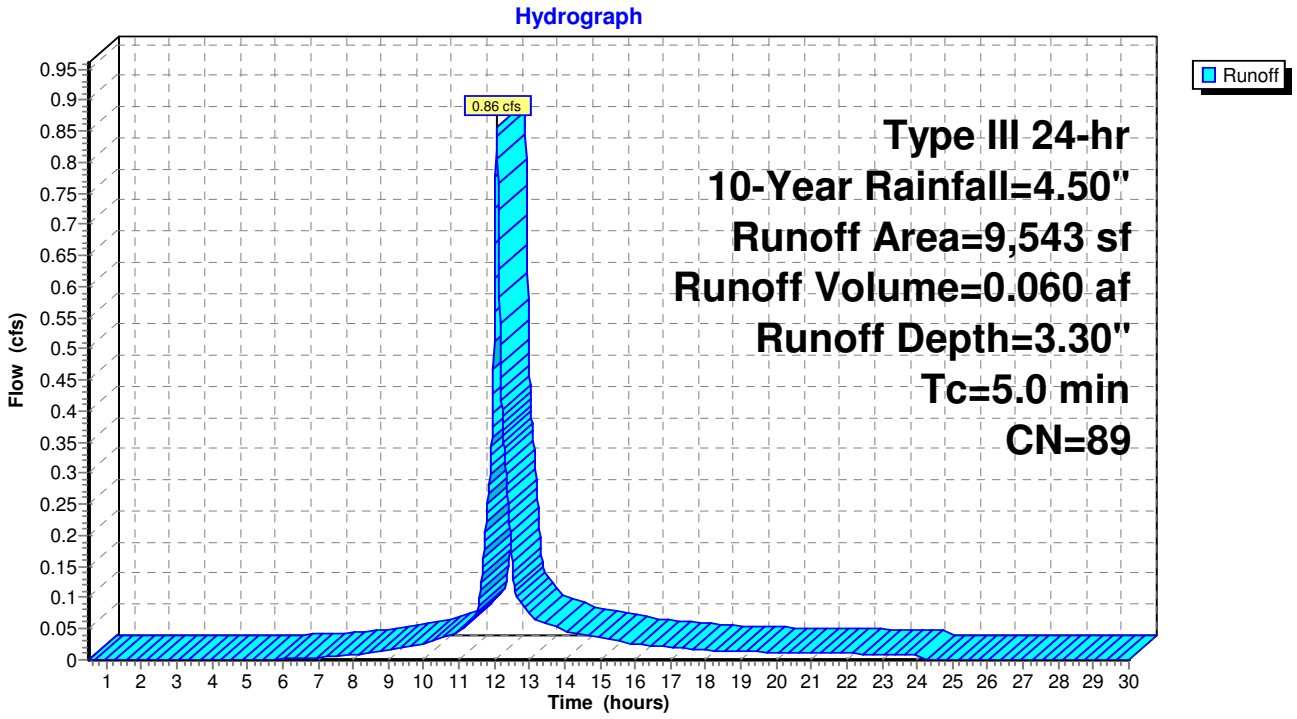
Runoff = 0.86 cfs @ 12.07 hrs, Volume= 0.060 af, Depth= 3.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.50"

	Area (sf)	CN	Description
*	3,661	98	Ex. House Roof
*	2,860	98	Paved Driveway
*	62	98	Landing/Steps
*	2,686	72	Dirt
	274	39	>75% Grass cover, Good, HSG A
	9,543	89	Weighted Average
	2,960		31.02% Pervious Area
	6,583		68.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment E1: Catch Basin on Site



Summary for Subcatchment P1: Floor Drain (On Site)

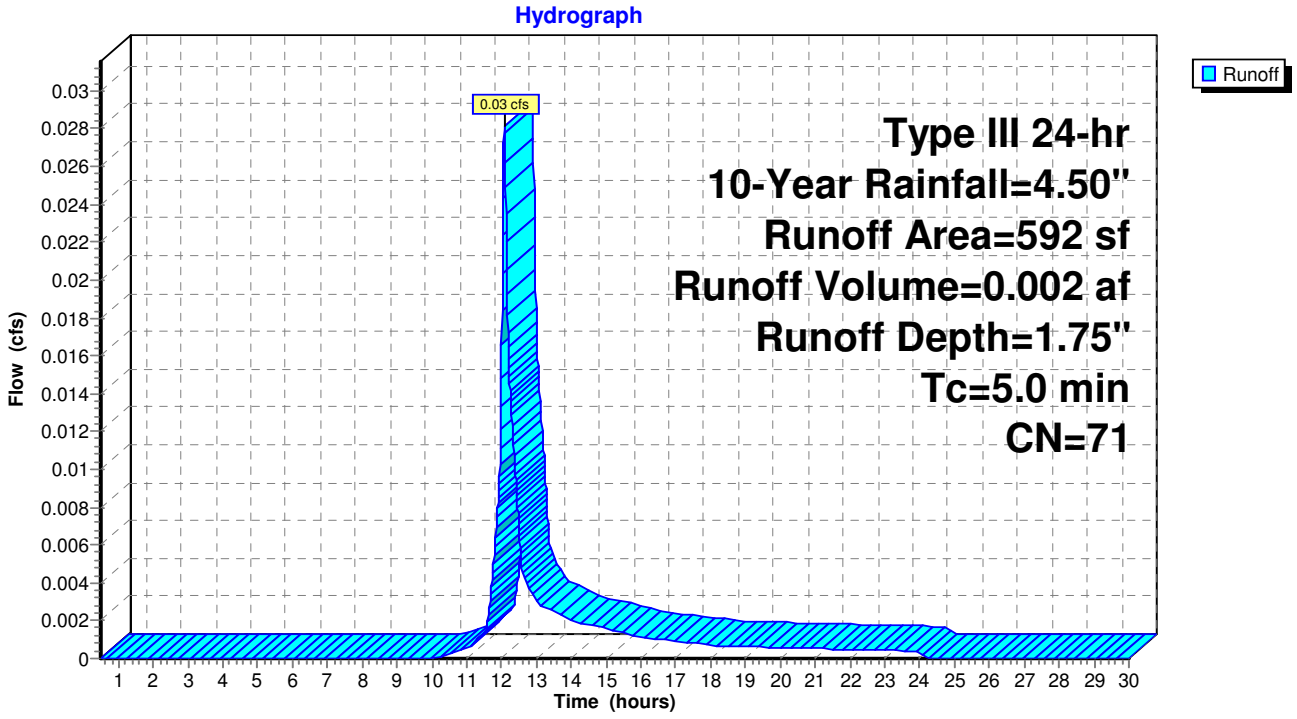
Runoff = 0.03 cfs @ 12.08 hrs, Volume= 0.002 af, Depth= 1.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.50"

	Area (sf)	CN	Description
*	325	98	Parking Lot (portion)
	267	39	>75% Grass cover, Good, HSG A
	592	71	Weighted Average
	267		45.10% Pervious Area
	325		54.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment P1: Floor Drain (On Site)



Summary for Subcatchment PD: Driveway

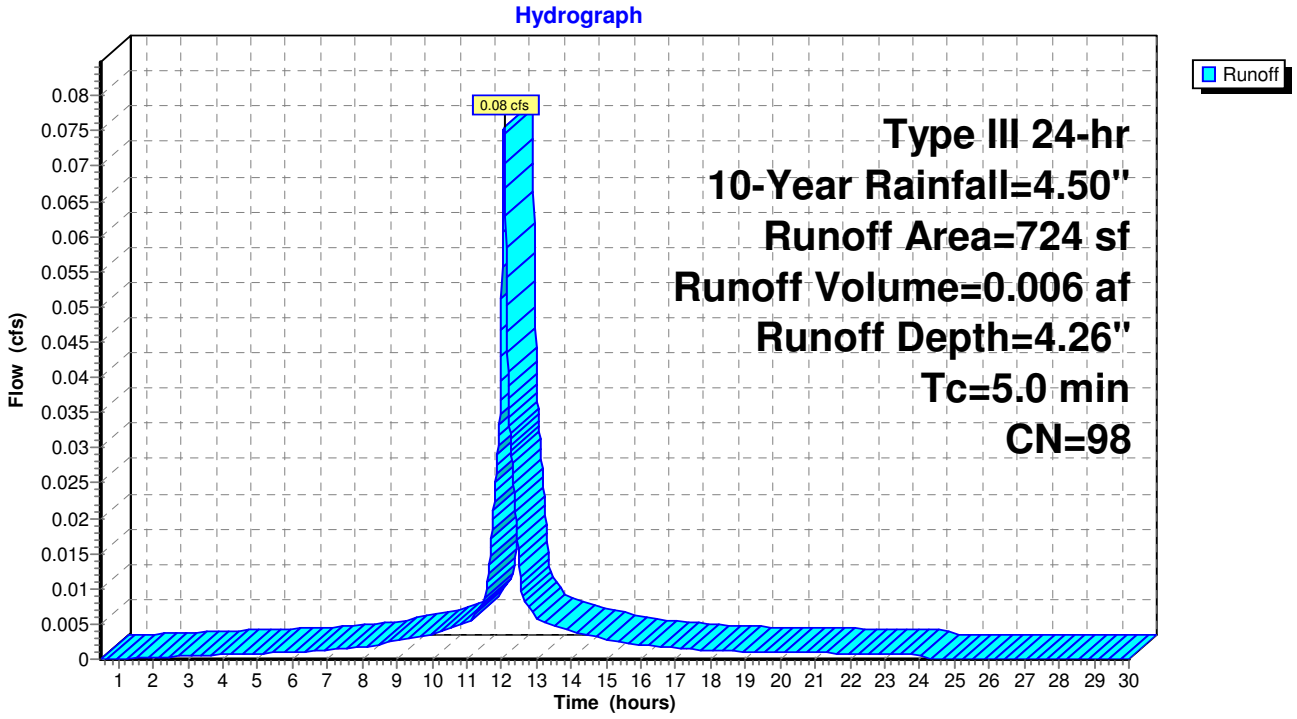
Runoff = 0.08 cfs @ 12.07 hrs, Volume= 0.006 af, Depth= 4.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.50"

	Area (sf)	CN	Description
*	724	98	Paved Driveway
	724		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment PD: Driveway



Summary for Subcatchment PL1: Plaza-1

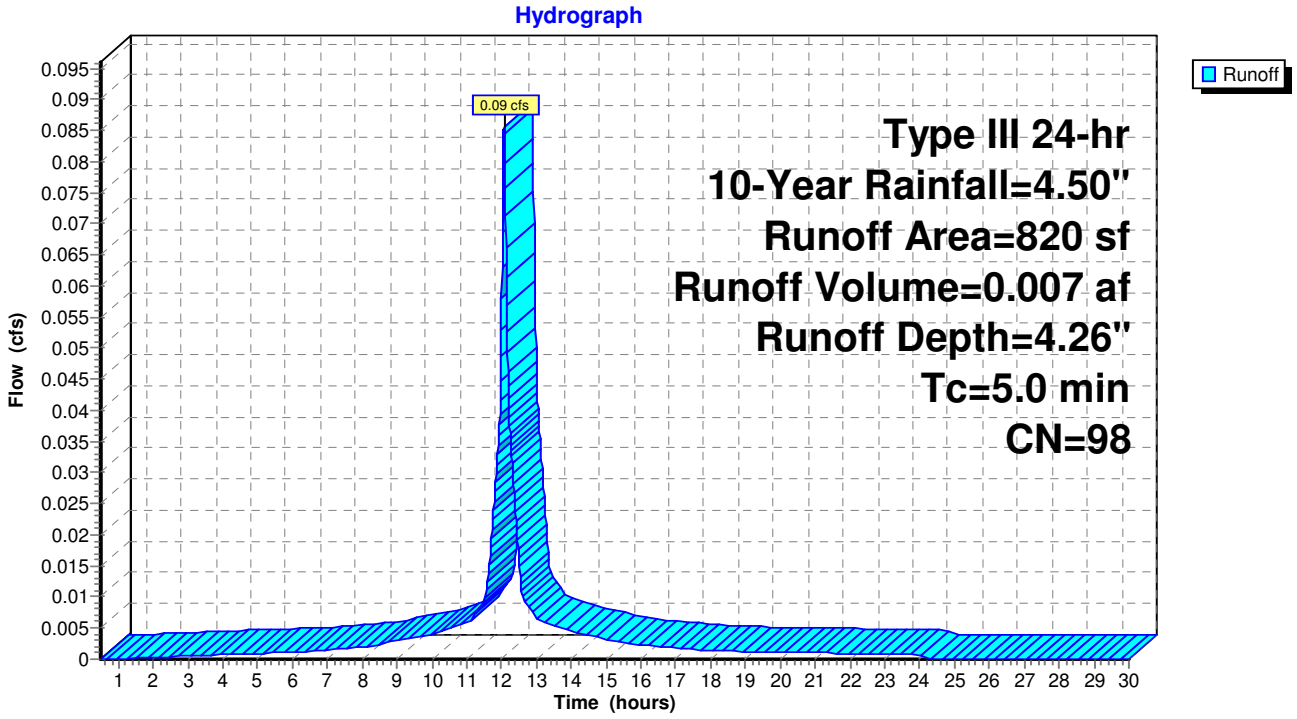
Runoff = 0.09 cfs @ 12.07 hrs, Volume= 0.007 af, Depth= 4.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.50"

	Area (sf)	CN	Description
*	820	98	Paza-1
	820		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment PL1: Plaza-1



Summary for Subcatchment PL2: Plaza-2

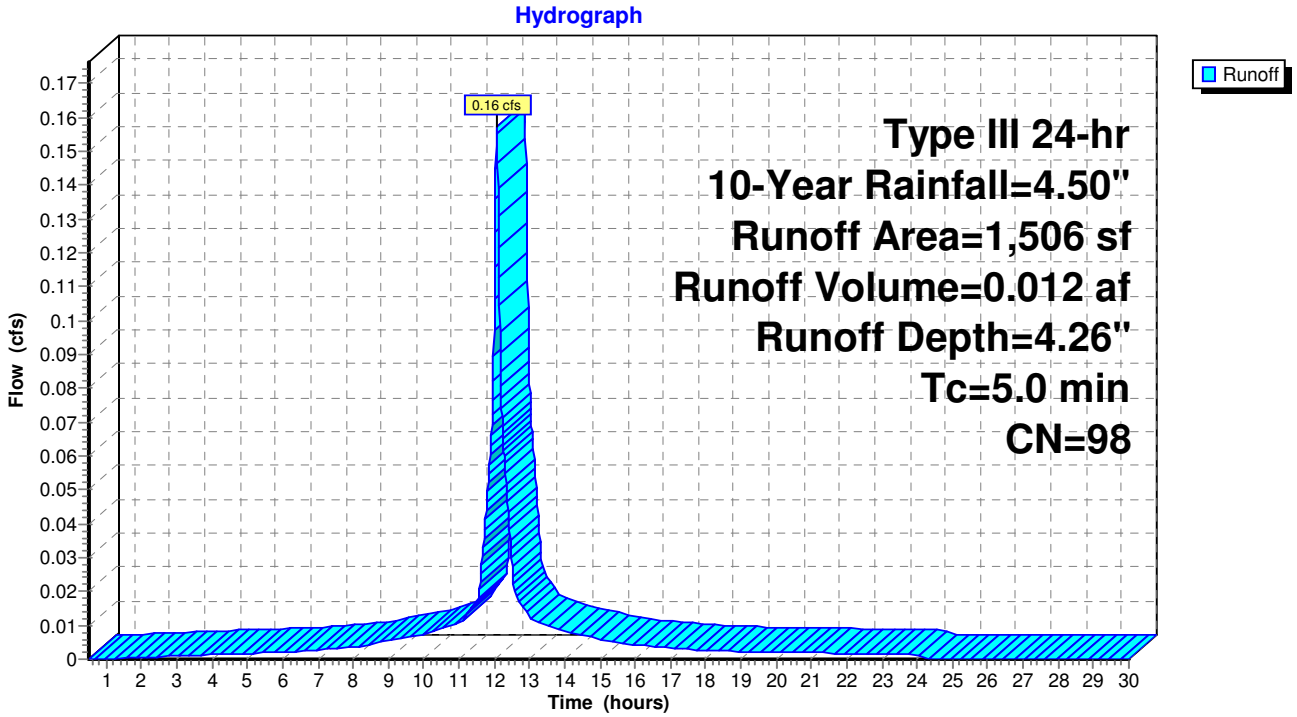
Runoff = 0.16 cfs @ 12.07 hrs, Volume= 0.012 af, Depth= 4.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.50"

	Area (sf)	CN	Description
*	1,506	98	Paza-2
	1,506		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment PL2: Plaza-2



Summary for Subcatchment PR1: Roof-1

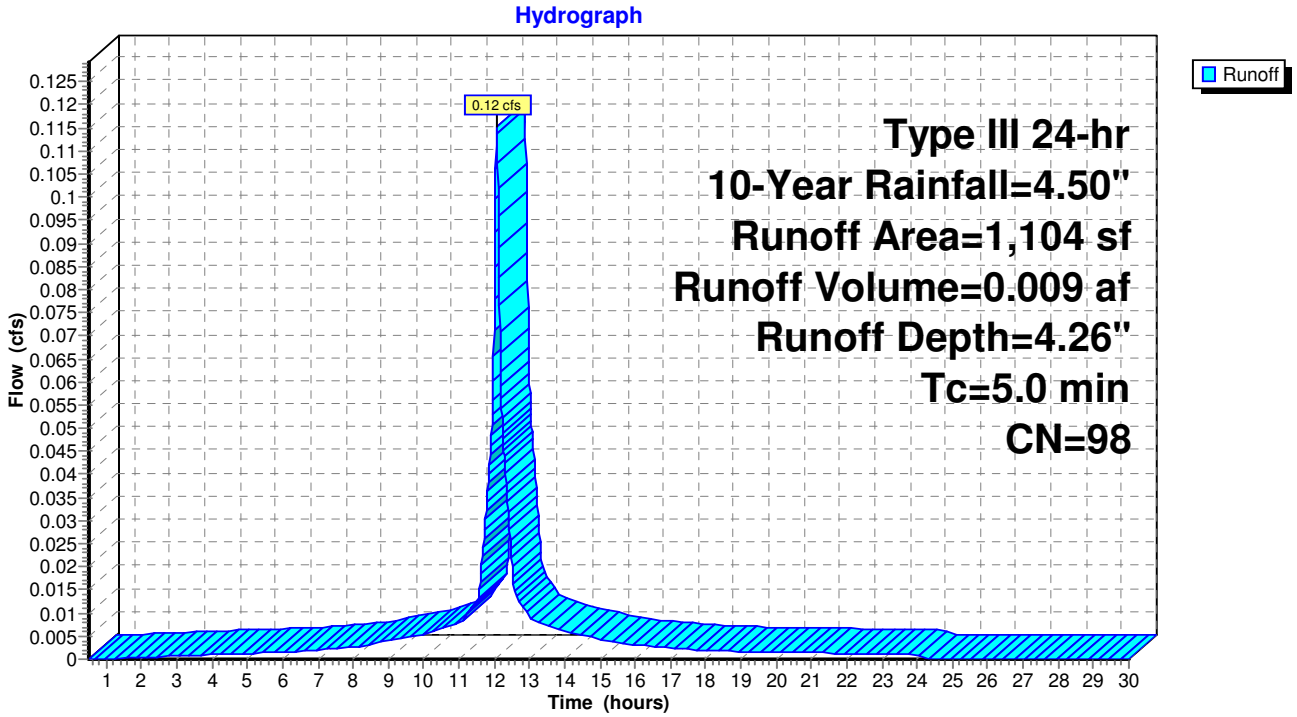
Runoff = 0.12 cfs @ 12.07 hrs, Volume= 0.009 af, Depth= 4.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.50"

	Area (sf)	CN	Description
*	1,104	98	Prop. Roof-1
	1,104		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment PR1: Roof-1



Summary for Subcatchment PR2: Roof-2

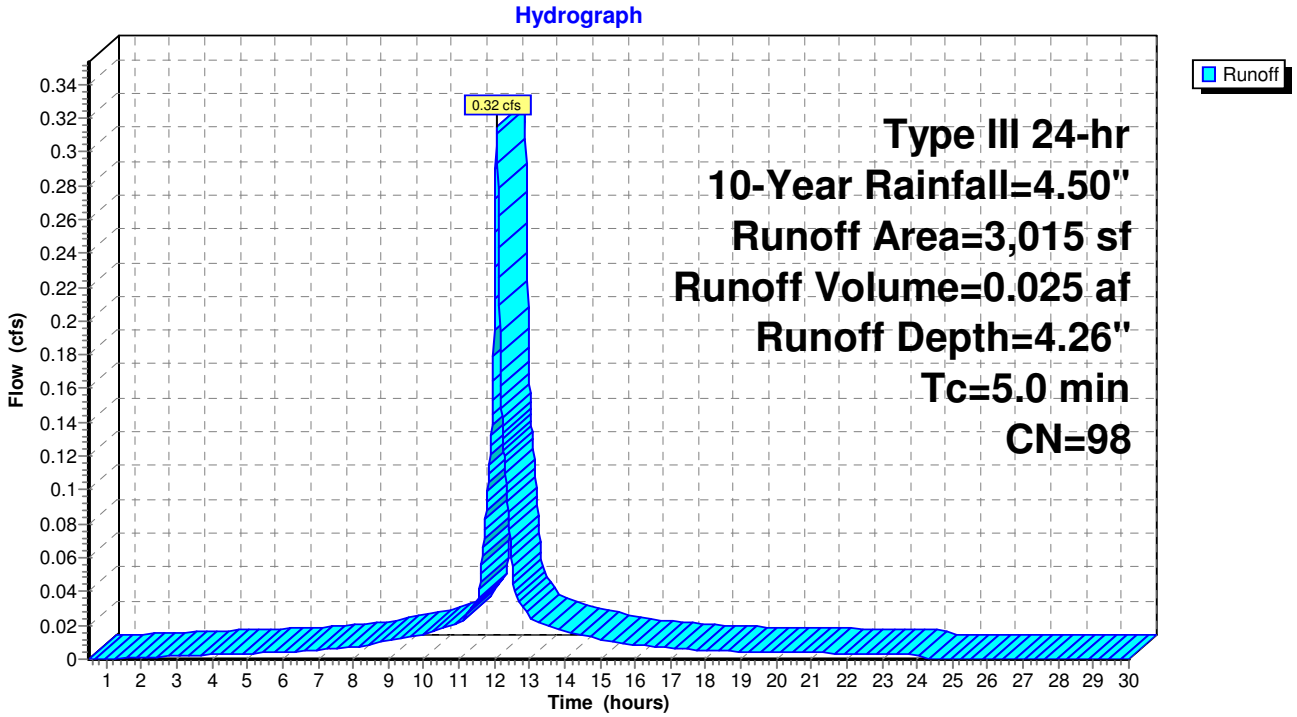
Runoff = 0.32 cfs @ 12.07 hrs, Volume= 0.025 af, Depth= 4.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.50"

	Area (sf)	CN	Description
*	3,015	98	Prop. Roof-2
	3,015		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment PR2: Roof-2



Summary for Subcatchment PR3: Roof-3

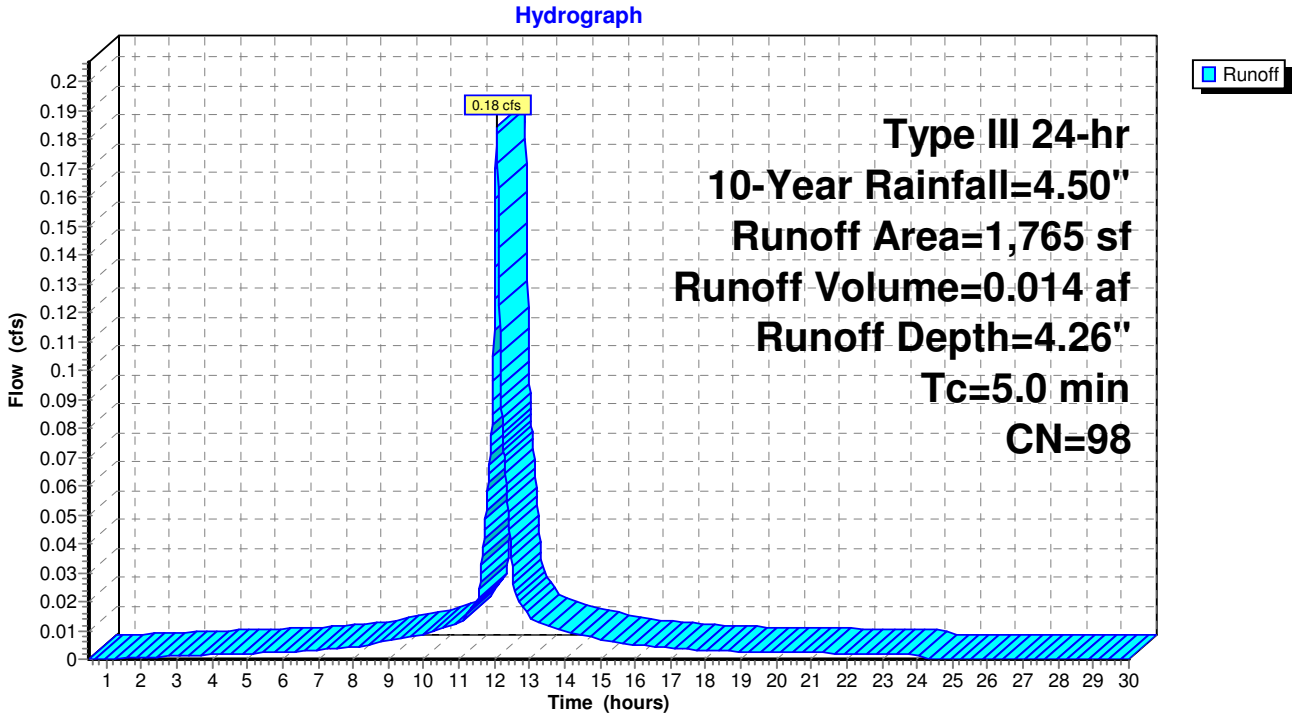
Runoff = 0.18 cfs @ 12.07 hrs, Volume= 0.014 af, Depth= 4.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.50"

	Area (sf)	CN	Description
*	1,765	98	Prop. Roof-3
	1,765		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment PR3: Roof-3

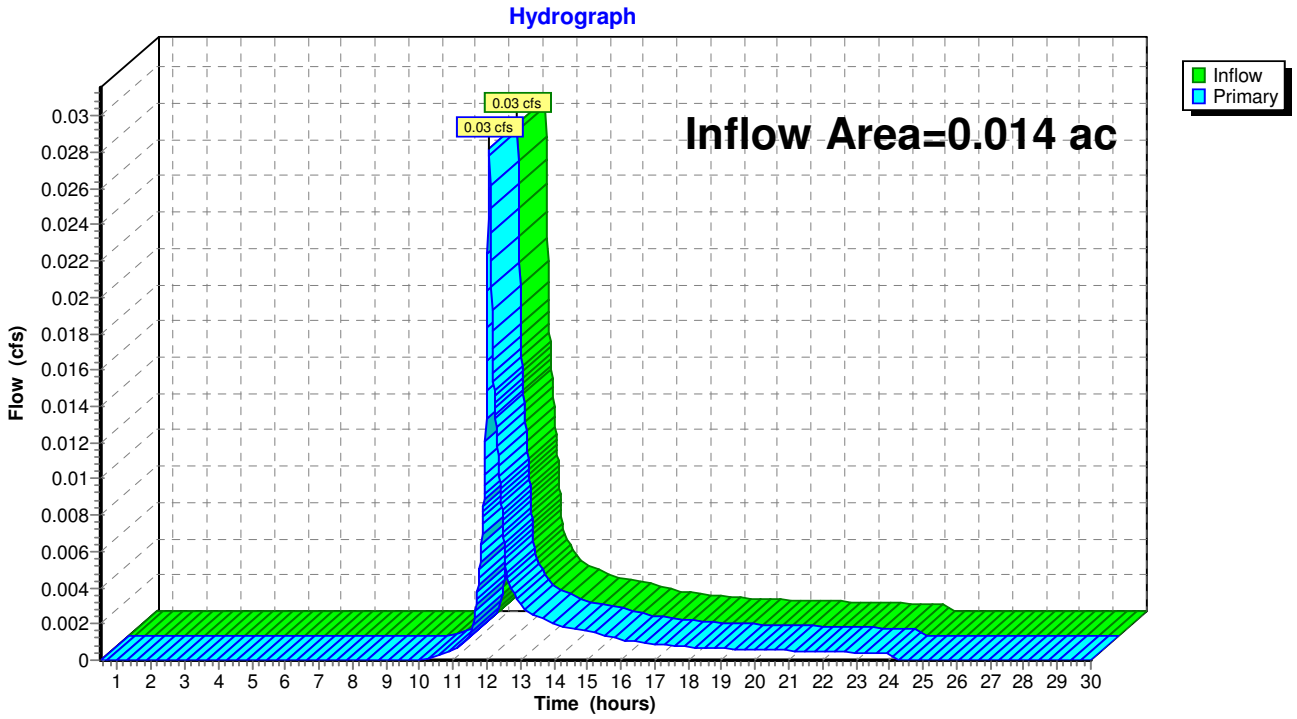


Summary for Pond CS: City Sewer

Inflow Area = 0.014 ac, 54.90% Impervious, Inflow Depth = 1.75" for 10-Year event
Inflow = 0.03 cfs @ 12.08 hrs, Volume= 0.002 af
Primary = 0.03 cfs @ 12.08 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs

Pond CS: City Sewer



Summary for Pond INF-1: Inf. System #1 Galleys

Inflow Area = 0.130 ac,100.00% Impervious, Inflow Depth = 4.26" for 10-Year event
Inflow = 0.59 cfs @ 12.07 hrs, Volume= 0.046 af
Outflow = 0.10 cfs @ 11.67 hrs, Volume= 0.046 af, Atten= 83%, Lag= 0.0 min
Discarded = 0.10 cfs @ 11.67 hrs, Volume= 0.046 af
Secondary = 0.00 cfs @ 0.50 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Peak Elev= 42.40' @ 12.52 hrs Surf.Area= 0.014 ac Storage= 0.011 af

Plug-Flow detention time= 26.0 min calculated for 0.046 af (100% of inflow)
Center-of-Mass det. time= 26.0 min (774.9 - 748.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	40.70'	0.012 af	**12.00'W x 52.00'L x 4.00'H Field A** 0.057 af Overall - 0.024 af Embedded = 0.033 af x 35.0% Voids
#2A	41.70'	0.017 af	**Concrete Galley 4x4x3** x 24 Inside #1 Inside= 42.0"W x 30.0"H => 8.91 sf x 3.50'L = 31.2 cf Outside= 48.0"W x 36.0"H => 10.81 sf x 4.00'L = 43.2 cf 2 Rows of 12 Chambers
		0.029 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	40.70'	**7.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Secondary	43.70'	**6.0" Round 6" Connection X 2.00** L= 13.7' Ke= 0.200 Inlet / Outlet Invert= 43.70' / 43.70' S= 0.0000 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.10 cfs @ 11.67 hrs HW=40.74' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.50 hrs HW=40.70' (Free Discharge)
↑**2=6" Connection** (Controls 0.00 cfs)

Pond INF-1: Inf. System #1 Galleys - Chamber Wizard Field A

Chamber Model = Concrete Galley 4x4x3 (Concrete Galley, Shea LE-EGLPH, LE-CGLPH or equivalent)
Inside= 42.0"W x 30.0"H => 8.91 sf x 3.50'L = 31.2 cf
Outside= 48.0"W x 36.0"H => 10.81 sf x 4.00'L = 43.2 cf

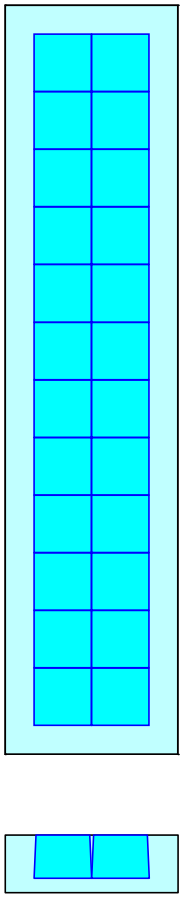
12 Chambers/Row x 4.00' Long = 48.00' Row Length +24.0" End Stone x 2 = 52.00' Base Length
2 Rows x 48.0" Wide + 24.0" Side Stone x 2 = 12.00' Base Width
12.0" Base + 36.0" Chamber Height = 4.00' Field Height

24 Chambers x 31.2 cf = 748.6 cf Chamber Storage
24 Chambers x 43.2 cf = 1,037.7 cf Displacement

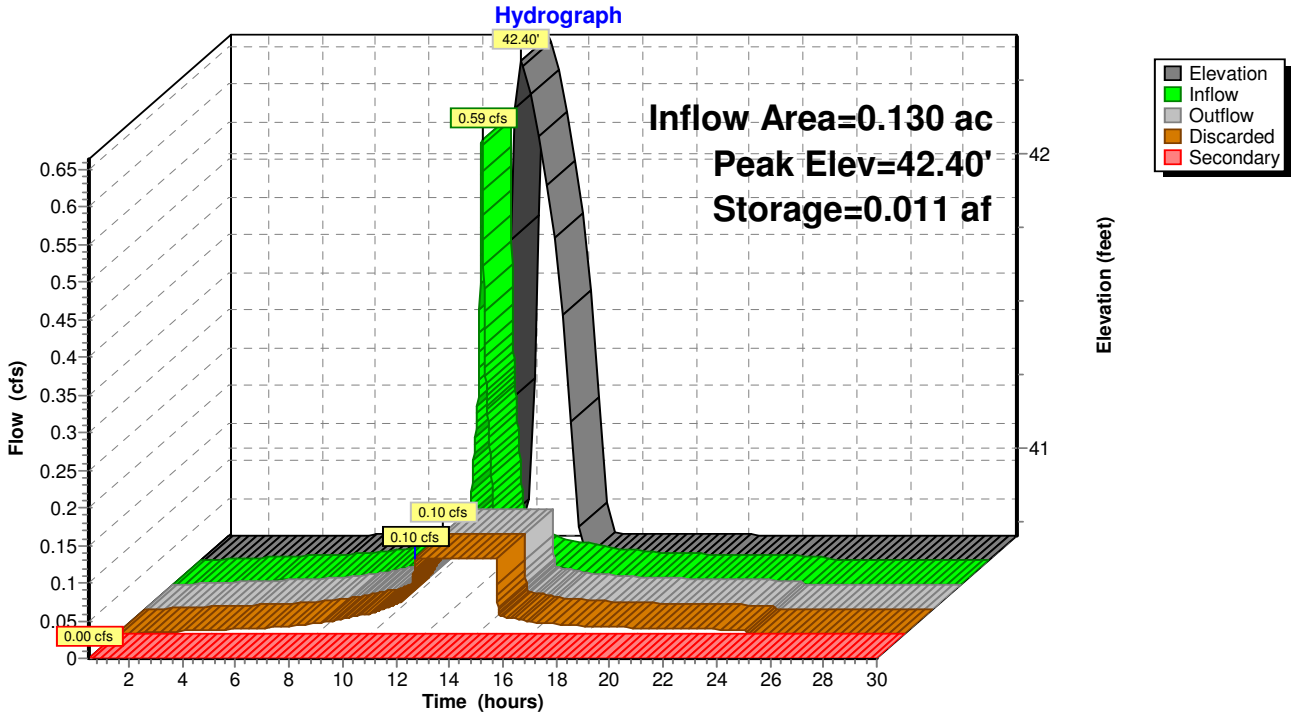
2,496.0 cf Field - 1,037.7 cf Chambers = 1,458.3 cf Stone x 35.0% Voids = 510.4 cf Stone Storage

Chamber Storage + Stone Storage = 1,259.0 cf = 0.029 af
Overall Storage Efficiency = 50.4%
Overall System Size = 52.00' x 12.00' x 4.00'

24 Chambers
92.4 cy Field
54.0 cy Stone



Pond INF-1: Inf. System #1 Galleys



Summary for Pond INF-2: Inf. System #2 Galleys

Inflow Area = 0.075 ac,100.00% Impervious, Inflow Depth = 4.26" for 10-Year event
Inflow = 0.34 cfs @ 12.07 hrs, Volume= 0.027 af
Outflow = 0.09 cfs @ 11.79 hrs, Volume= 0.027 af, Atten= 73%, Lag= 0.0 min
Discarded = 0.09 cfs @ 11.79 hrs, Volume= 0.027 af

Routing by Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Peak Elev= 41.66' @ 12.40 hrs Surf.Area= 0.013 ac Storage= 0.005 af

Plug-Flow detention time= 9.7 min calculated for 0.027 af (100% of inflow)
Center-of-Mass det. time= 9.7 min (758.6 - 748.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	40.69'	0.011 af	**12.00'W x 48.00'L x 4.00'H Field A** 0.053 af Overall - 0.022 af Embedded = 0.031 af x 35.0% Voids
#2A	41.69'	0.016 af	**Concrete Galley 4x4x3** x 22 Inside #1 Inside= 42.0"W x 30.0"H => 8.91 sf x 3.50'L = 31.2 cf Outside= 48.0"W x 36.0"H => 10.81 sf x 4.00'L = 43.2 cf 2 Rows of 11 Chambers
		0.027 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	40.69'	**7.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.09 cfs @ 11.79 hrs HW=40.73' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Pond INF-2: Inf. System #2 Galleys - Chamber Wizard Field A

Chamber Model = Concrete Galley 4x4x3 (Concrete Galley, Shea LE-EGLPH, LE-CGLPH or equivalent)
Inside= 42.0"W x 30.0"H => 8.91 sf x 3.50'L = 31.2 cf
Outside= 48.0"W x 36.0"H => 10.81 sf x 4.00'L = 43.2 cf

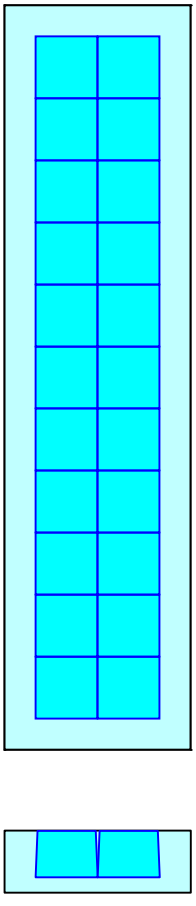
11 Chambers/Row x 4.00' Long = 44.00' Row Length +24.0" End Stone x 2 = 48.00' Base Length
2 Rows x 48.0" Wide + 24.0" Side Stone x 2 = 12.00' Base Width
12.0" Base + 36.0" Chamber Height = 4.00' Field Height

22 Chambers x 31.2 cf = 686.2 cf Chamber Storage
22 Chambers x 43.2 cf = 951.2 cf Displacement

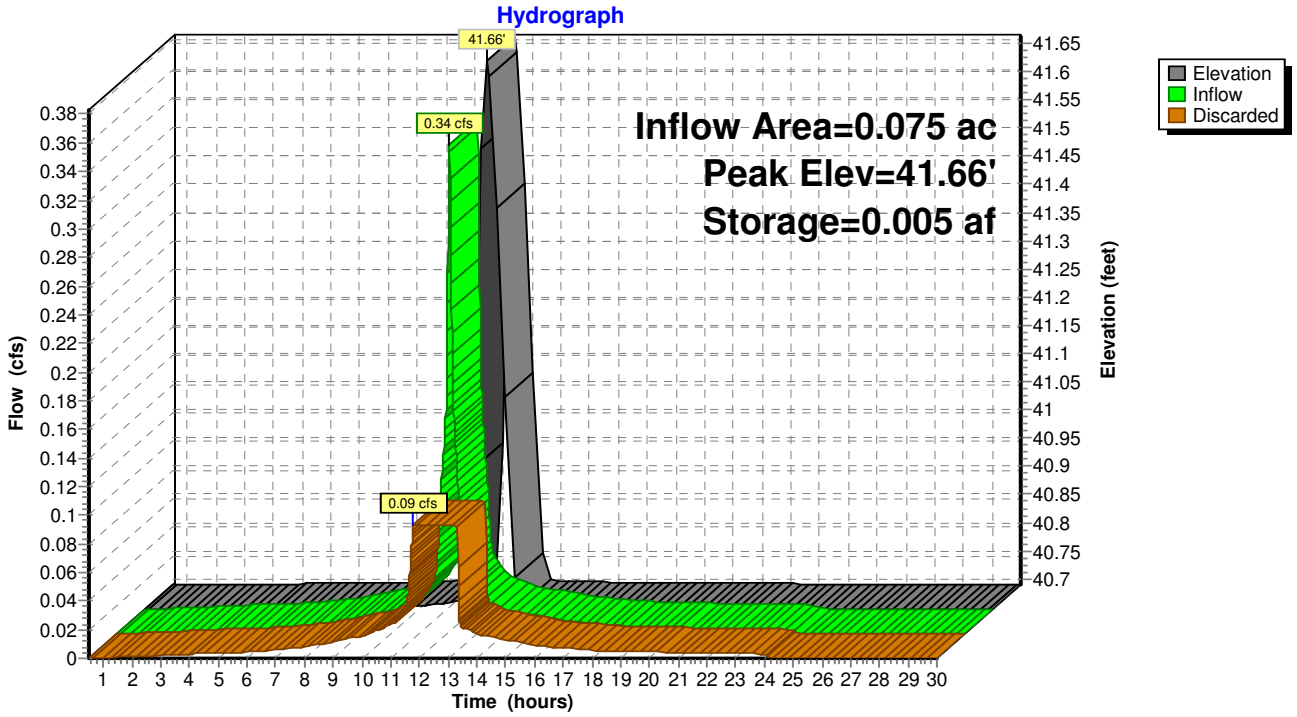
2,304.0 cf Field - 951.2 cf Chambers = 1,352.8 cf Stone x 35.0% Voids = 473.5 cf Stone Storage

Chamber Storage + Stone Storage = 1,159.7 cf = 0.027 af
Overall Storage Efficiency = 50.3%
Overall System Size = 48.00' x 12.00' x 4.00'

22 Chambers
85.3 cy Field
50.1 cy Stone



Pond INF-2: Inf. System #2 Galleys



Summary for Subcatchment E1: Catch Basin on Site

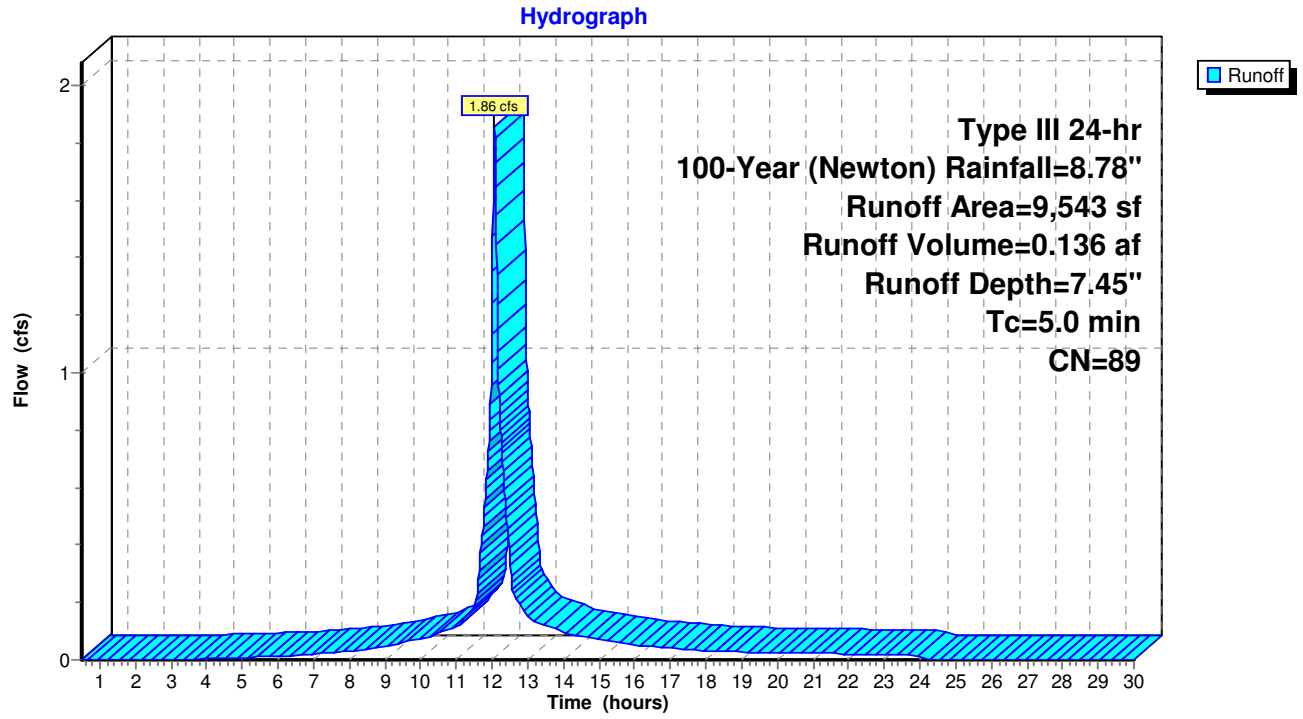
Runoff = 1.86 cfs @ 12.07 hrs, Volume= 0.136 af, Depth= 7.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year (Newton) Rainfall=8.78"

	Area (sf)	CN	Description
*	3,661	98	Ex. House Roof
*	2,860	98	Paved Driveway
*	62	98	Landing/Steps
*	2,686	72	Dirt
	274	39	>75% Grass cover, Good, HSG A
	9,543	89	Weighted Average
	2,960		31.02% Pervious Area
	6,583		68.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment E1: Catch Basin on Site



Summary for Subcatchment P1: Floor Drain (On Site)

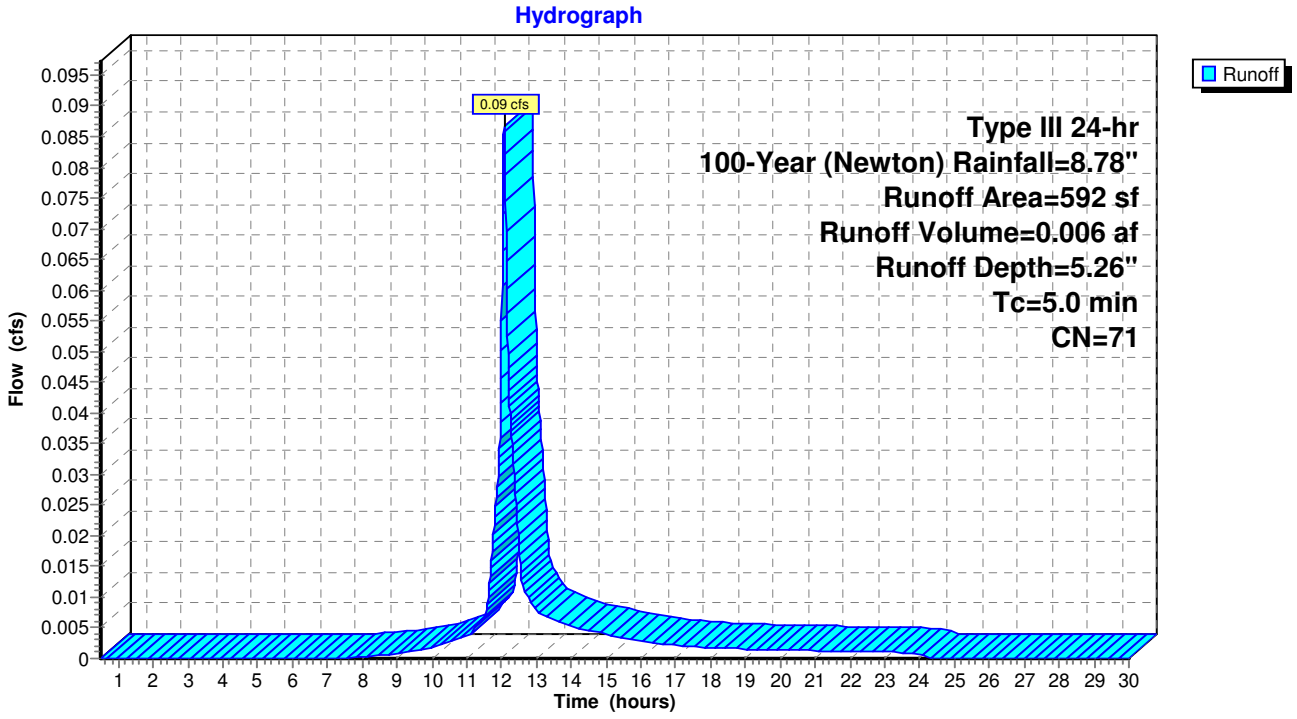
Runoff = 0.09 cfs @ 12.07 hrs, Volume= 0.006 af, Depth= 5.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year (Newton) Rainfall=8.78"

	Area (sf)	CN	Description
*	325	98	Parking Lot (portion)
	267	39	>75% Grass cover, Good, HSG A
	592	71	Weighted Average
	267		45.10% Pervious Area
	325		54.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment P1: Floor Drain (On Site)



Summary for Subcatchment PD: Driveway

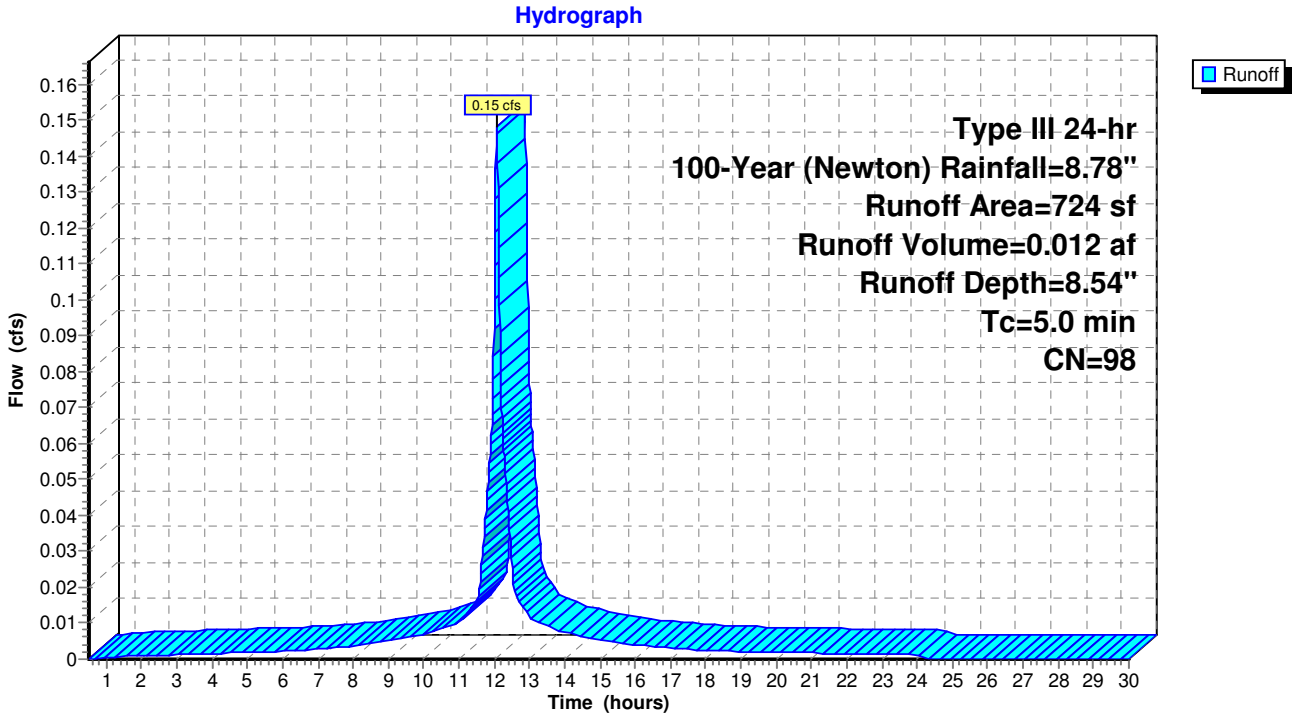
Runoff = 0.15 cfs @ 12.07 hrs, Volume= 0.012 af, Depth= 8.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year (Newton) Rainfall=8.78"

	Area (sf)	CN	Description
*	724	98	Paved Driveway
	724		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment PD: Driveway



Summary for Subcatchment PL1: Plaza-1

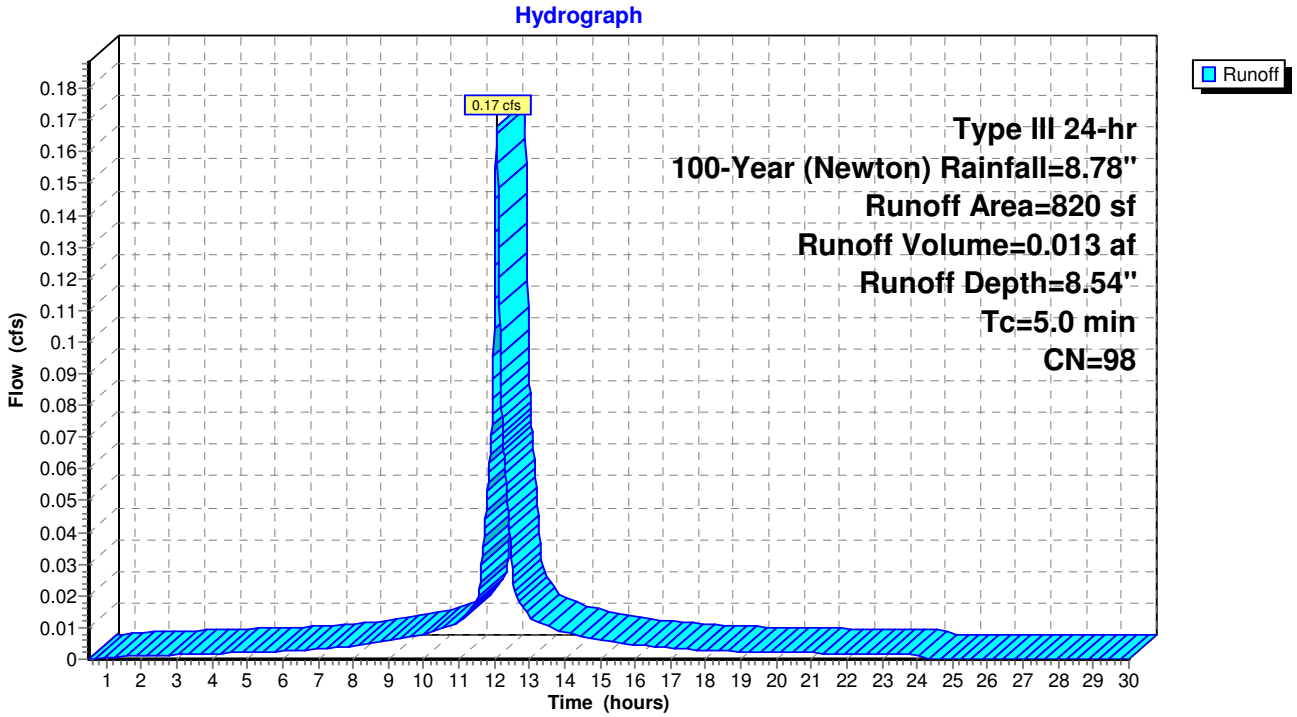
Runoff = 0.17 cfs @ 12.07 hrs, Volume= 0.013 af, Depth= 8.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year (Newton) Rainfall=8.78"

	Area (sf)	CN	Description
*	820	98	Paza-1
	820		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment PL1: Plaza-1



Summary for Subcatchment PL2: Plaza-2

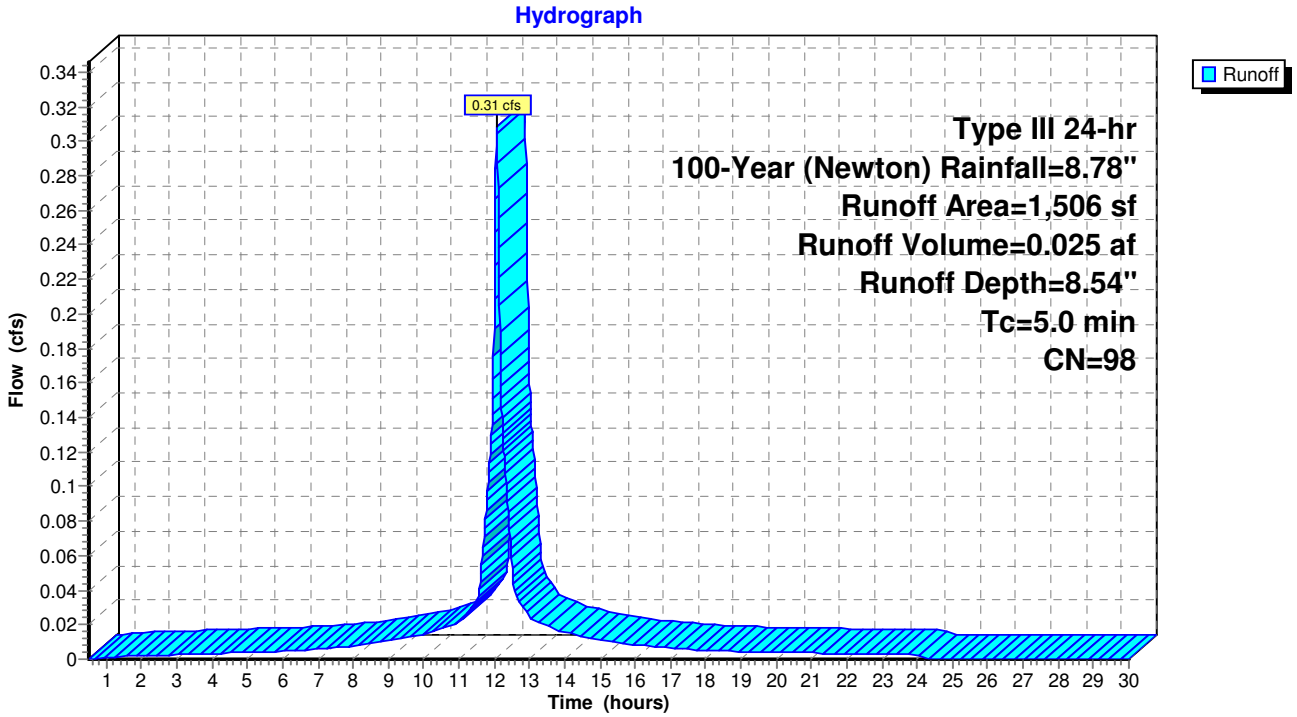
Runoff = 0.31 cfs @ 12.07 hrs, Volume= 0.025 af, Depth= 8.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year (Newton) Rainfall=8.78"

	Area (sf)	CN	Description
*	1,506	98	Paza-2
	1,506		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment PL2: Plaza-2



Summary for Subcatchment PR1: Roof-1

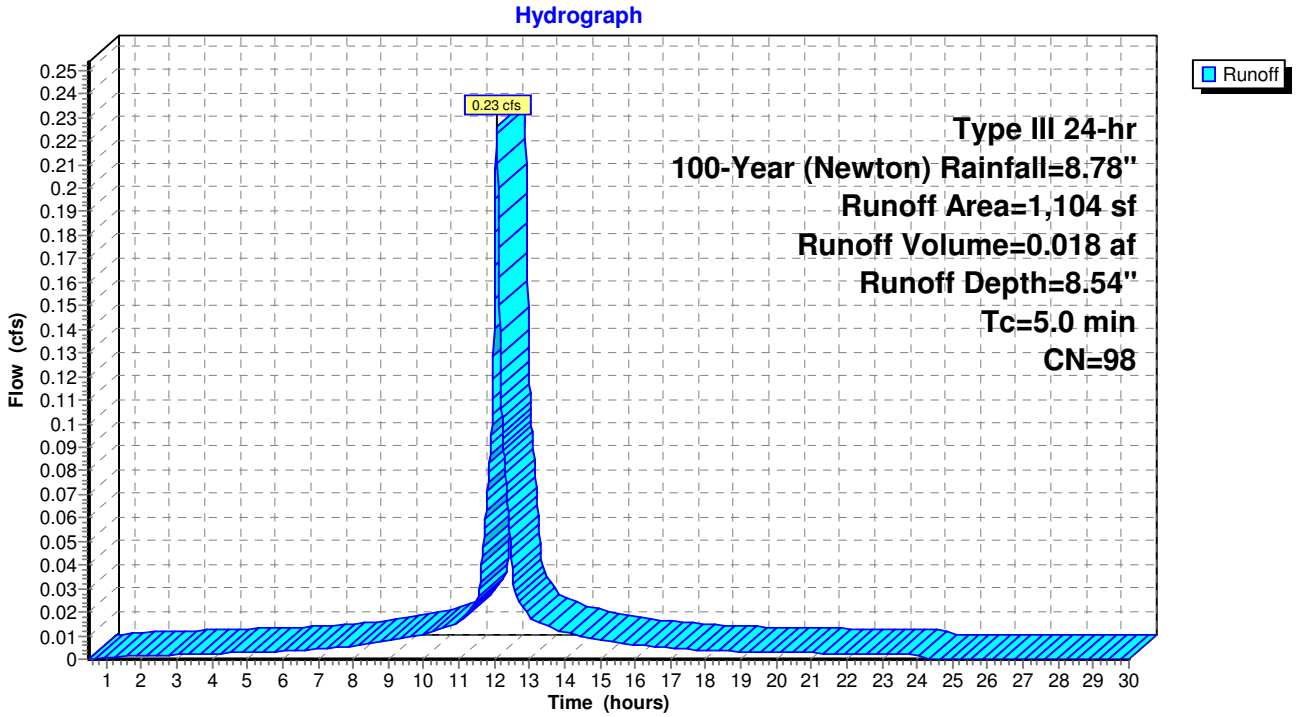
Runoff = 0.23 cfs @ 12.07 hrs, Volume= 0.018 af, Depth= 8.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year (Newton) Rainfall=8.78"

	Area (sf)	CN	Description
*	1,104	98	Prop. Roof-1
	1,104		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment PR1: Roof-1



Summary for Subcatchment PR2: Roof-2

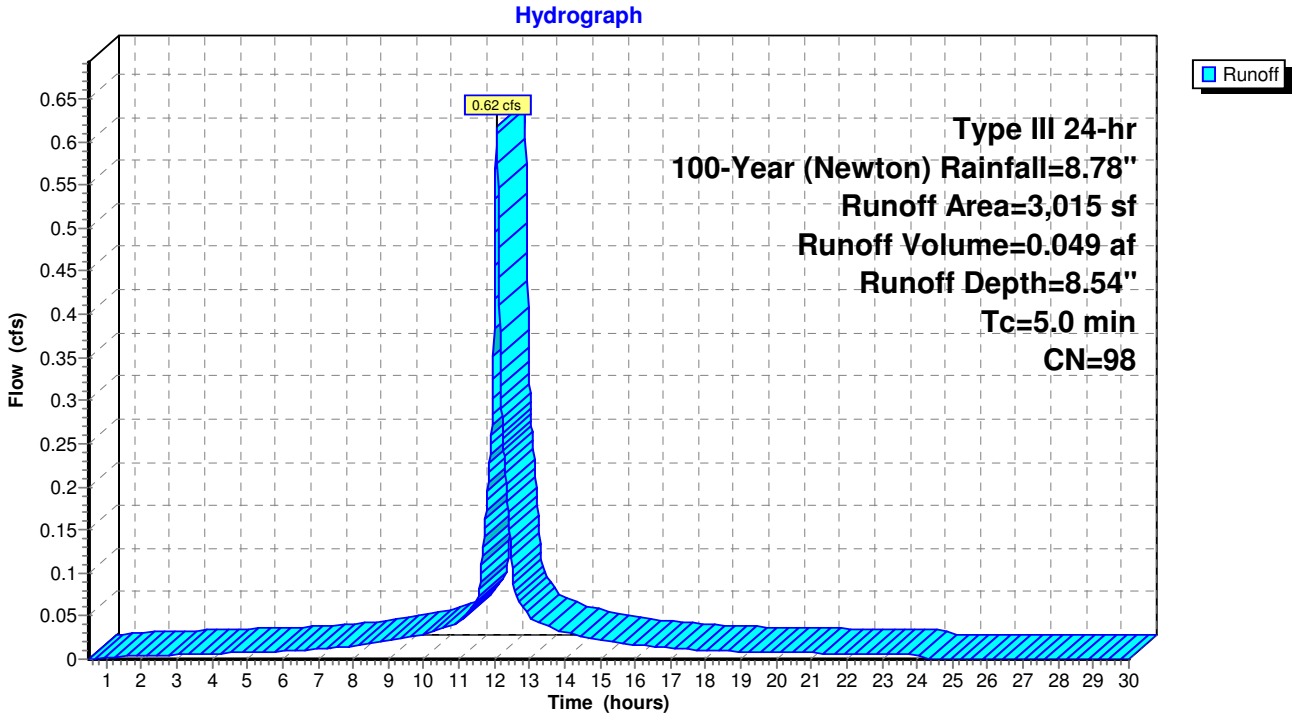
Runoff = 0.62 cfs @ 12.07 hrs, Volume= 0.049 af, Depth= 8.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year (Newton) Rainfall=8.78"

	Area (sf)	CN	Description
*	3,015	98	Prop. Roof-2
	3,015		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment PR2: Roof-2



Summary for Subcatchment PR3: Roof-3

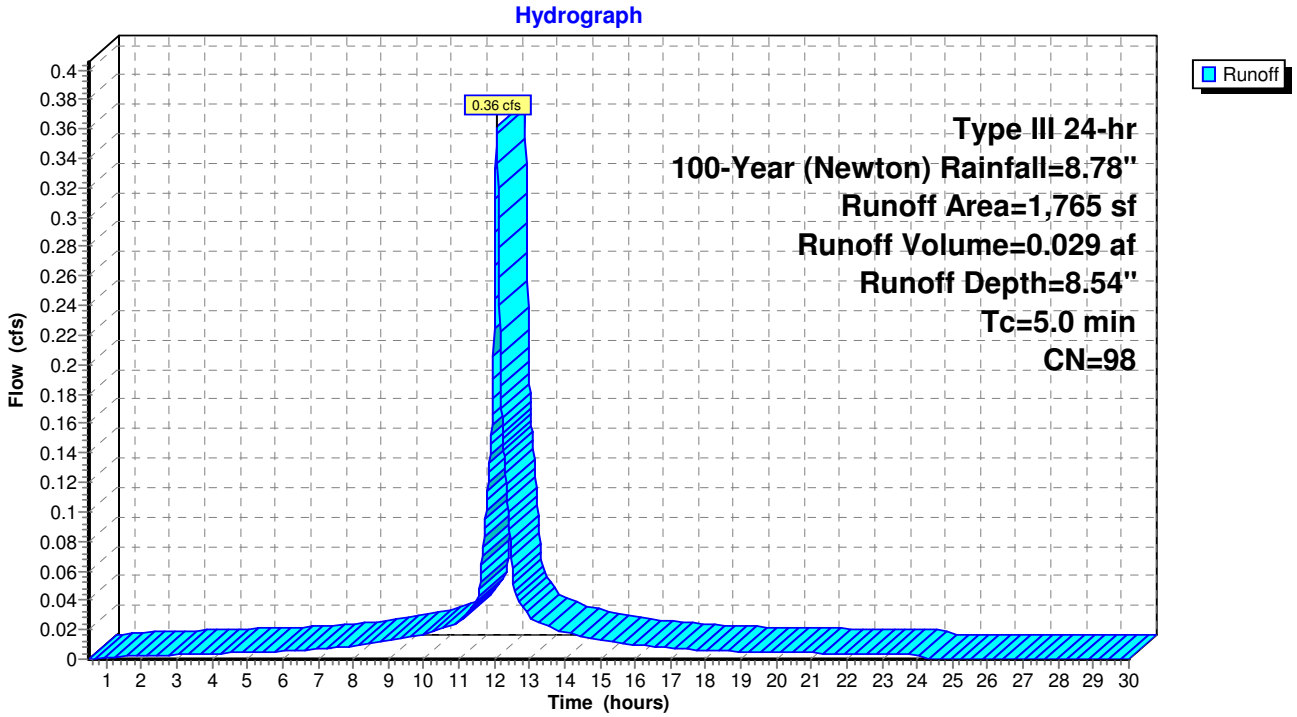
Runoff = 0.36 cfs @ 12.07 hrs, Volume= 0.029 af, Depth= 8.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year (Newton) Rainfall=8.78"

	Area (sf)	CN	Description
*	1,765	98	Prop. Roof-3
	1,765		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Minimum**

Subcatchment PR3: Roof-3

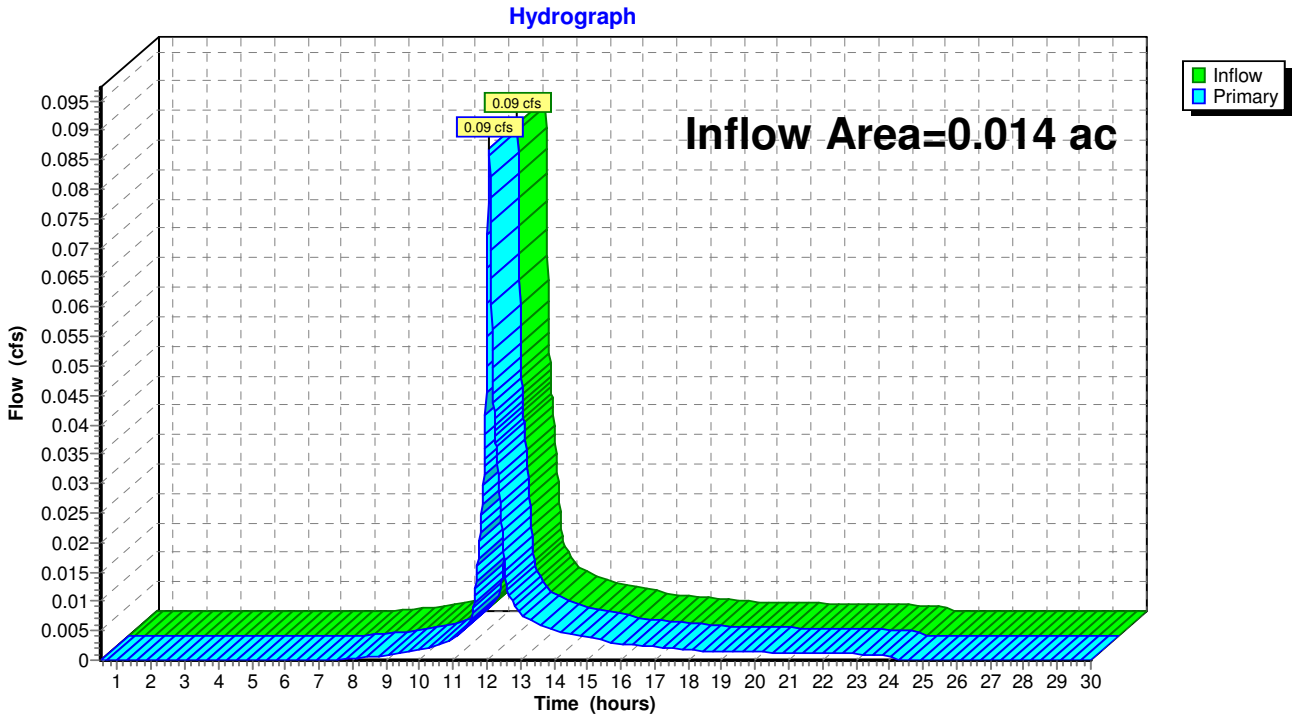


Summary for Pond CS: City Sewer

Inflow Area = 0.014 ac, 54.90% Impervious, Inflow Depth = 5.26" for 100-Year (Newton) event
Inflow = 0.09 cfs @ 12.07 hrs, Volume= 0.006 af
Primary = 0.09 cfs @ 12.07 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs

Pond CS: City Sewer



Summary for Pond INF-1: Inf. System #1 Galleys

Inflow Area = 0.130 ac,100.00% Impervious, Inflow Depth = 8.54" for 100-Year (Newton) event
Inflow = 1.16 cfs @ 12.07 hrs, Volume= 0.093 af
Outflow = 0.36 cfs @ 12.36 hrs, Volume= 0.093 af, Atten= 69%, Lag= 17.1 min
Discarded = 0.10 cfs @ 11.27 hrs, Volume= 0.085 af
Secondary = 0.26 cfs @ 12.36 hrs, Volume= 0.007 af

Routing by Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Peak Elev= 43.99' @ 12.36 hrs Surf.Area= 0.014 ac Storage= 0.026 af

Plug-Flow detention time= 61.3 min calculated for 0.093 af (100% of inflow)
Center-of-Mass det. time= 61.3 min (800.4 - 739.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	40.70'	0.012 af	**12.00'W x 52.00'L x 4.00'H Field A** 0.057 af Overall - 0.024 af Embedded = 0.033 af x 35.0% Voids
#2A	41.70'	0.017 af	**Concrete Galley 4x4x3** x 24 Inside #1 Inside= 42.0"W x 30.0"H => 8.91 sf x 3.50'L = 31.2 cf Outside= 48.0"W x 36.0"H => 10.81 sf x 4.00'L = 43.2 cf 2 Rows of 12 Chambers
		0.029 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	40.70'	**7.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Secondary	43.70'	**6.0" Round 6" Connection X 2.00** L= 13.7' Ke= 0.200 Inlet / Outlet Invert= 43.70' / 43.70' S= 0.0000 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.10 cfs @ 11.27 hrs HW=40.74' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Secondary OutFlow Max=0.26 cfs @ 12.36 hrs HW=43.99' (Free Discharge)
↑**2=6" Connection** (Barrel Controls 0.26 cfs @ 1.61 fps)

Pond INF-1: Inf. System #1 Galleys - Chamber Wizard Field A

Chamber Model = Concrete Galley 4x4x3 (Concrete Galley, Shea LE-EGLPH, LE-CGLPH or equivalent)
Inside= 42.0"W x 30.0"H => 8.91 sf x 3.50'L = 31.2 cf
Outside= 48.0"W x 36.0"H => 10.81 sf x 4.00'L = 43.2 cf

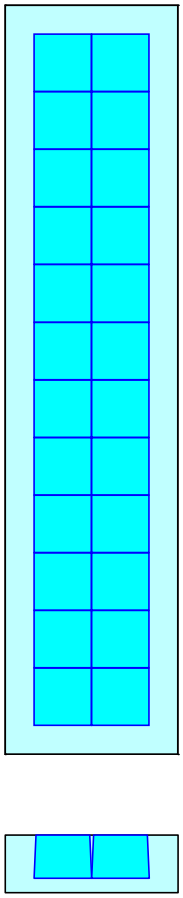
12 Chambers/Row x 4.00' Long = 48.00' Row Length +24.0" End Stone x 2 = 52.00' Base Length
2 Rows x 48.0" Wide + 24.0" Side Stone x 2 = 12.00' Base Width
12.0" Base + 36.0" Chamber Height = 4.00' Field Height

24 Chambers x 31.2 cf = 748.6 cf Chamber Storage
24 Chambers x 43.2 cf = 1,037.7 cf Displacement

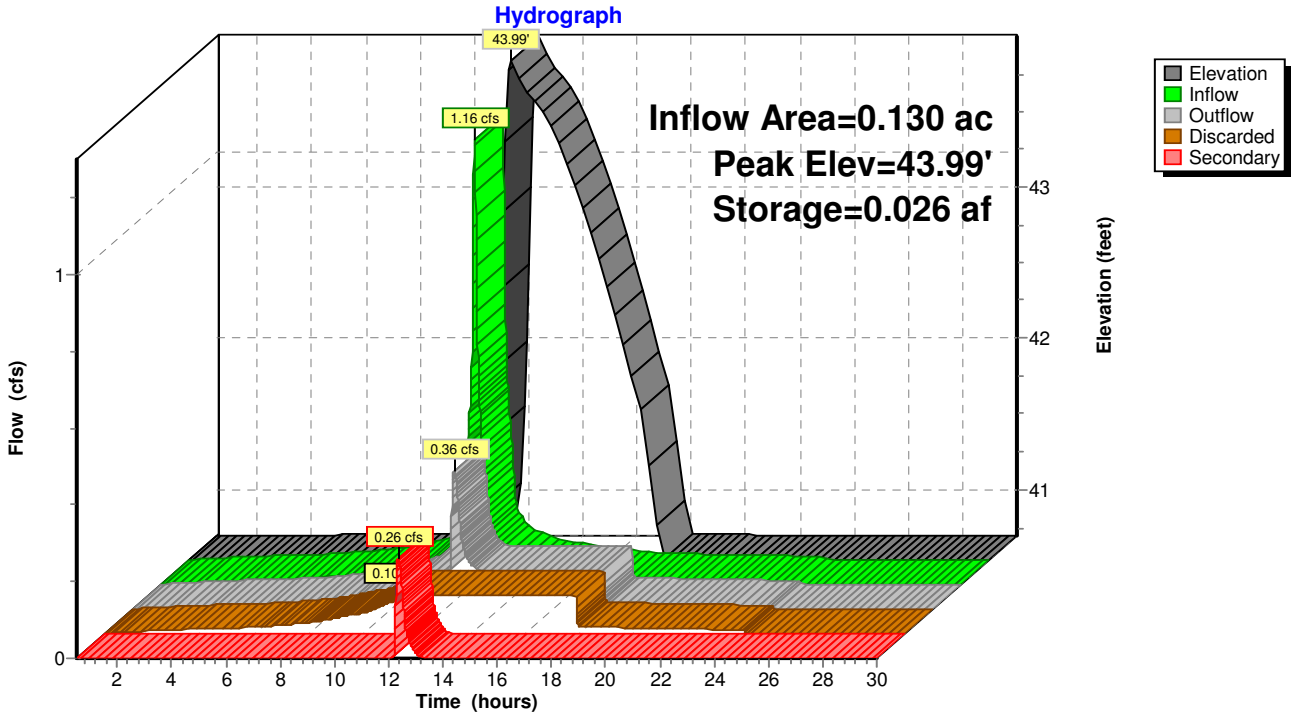
2,496.0 cf Field - 1,037.7 cf Chambers = 1,458.3 cf Stone x 35.0% Voids = 510.4 cf Stone Storage

Chamber Storage + Stone Storage = 1,259.0 cf = 0.029 af
Overall Storage Efficiency = 50.4%
Overall System Size = 52.00' x 12.00' x 4.00'

24 Chambers
92.4 cy Field
54.0 cy Stone



Pond INF-1: Inf. System #1 Galleys



Summary for Pond INF-2: Inf. System #2 Galleys

Inflow Area = 0.075 ac,100.00% Impervious, Inflow Depth = 9.71" for 100-Year (Newton) event
Inflow = 0.67 cfs @ 12.07 hrs, Volume= 0.061 af
Outflow = 0.09 cfs @ 11.62 hrs, Volume= 0.061 af, Atten= 86%, Lag= 0.0 min
Discarded = 0.09 cfs @ 11.62 hrs, Volume= 0.061 af

Routing by Stor-Ind method, Time Span= 0.50-30.00 hrs, dt= 0.01 hrs
Peak Elev= 43.64' @ 12.84 hrs Surf.Area= 0.013 ac Storage= 0.021 af

Plug-Flow detention time= 61.0 min calculated for 0.061 af (100% of inflow)
Center-of-Mass det. time= 60.9 min (801.2 - 740.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	40.69'	0.011 af	**12.00'W x 48.00'L x 4.00'H Field A** 0.053 af Overall - 0.022 af Embedded = 0.031 af x 35.0% Voids
#2A	41.69'	0.016 af	**Concrete Galley 4x4x3** x 22 Inside #1 Inside= 42.0"W x 30.0"H => 8.91 sf x 3.50'L = 31.2 cf Outside= 48.0"W x 36.0"H => 10.81 sf x 4.00'L = 43.2 cf 2 Rows of 11 Chambers
		0.027 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	40.69'	**7.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.09 cfs @ 11.62 hrs HW=40.73' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Pond INF-2: Inf. System #2 Galleys - Chamber Wizard Field A

Chamber Model = Concrete Galley 4x4x3 (Concrete Galley, Shea LE-EGLPH, LE-CGLPH or equivalent)
Inside= 42.0"W x 30.0"H => 8.91 sf x 3.50'L = 31.2 cf
Outside= 48.0"W x 36.0"H => 10.81 sf x 4.00'L = 43.2 cf

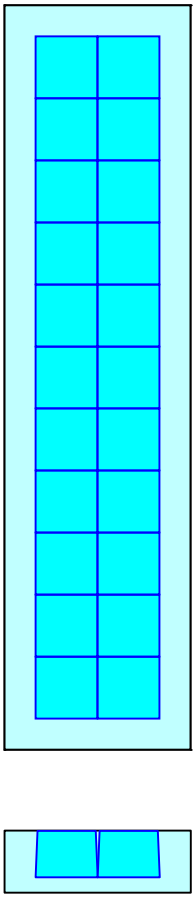
11 Chambers/Row x 4.00' Long = 44.00' Row Length +24.0" End Stone x 2 = 48.00' Base Length
2 Rows x 48.0" Wide + 24.0" Side Stone x 2 = 12.00' Base Width
12.0" Base + 36.0" Chamber Height = 4.00' Field Height

22 Chambers x 31.2 cf = 686.2 cf Chamber Storage
22 Chambers x 43.2 cf = 951.2 cf Displacement

2,304.0 cf Field - 951.2 cf Chambers = 1,352.8 cf Stone x 35.0% Voids = 473.5 cf Stone Storage

Chamber Storage + Stone Storage = 1,159.7 cf = 0.027 af
Overall Storage Efficiency = 50.3%
Overall System Size = 48.00' x 12.00' x 4.00'

22 Chambers
85.3 cy Field
50.1 cy Stone



Pond INF-2: Inf. System #2 Galleys